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IN TWO VOLUMES.

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> Of ricks, and turns, and falls, and byes,
> And all the courser's mysteries?"——BY A LADY.

BY

THOMAS THACKER.

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THE BREEDER'S GUIDE.

BREEDING,

AND SELECTION OF SIRE AND DAM.

——————— Ergo animos ævumque notabis
Præcipuè; hinc alias artes, prolemque parentum,
Et quis cinque dolor victo, quæ gloria palmæ.
Virg. G. Lib. 3, 100.

His age and courage weigh; nor those alone,
But note his father's virtues, and his own:
Observe, if he disdains to yield the prize;
Of loss impatient, proud of victories.
Dryden.

In the consideration on breeding animals of any description it is necessary, in the first place, to know on what principle nature directs its course, or in other words, to know the true theory on the subject; after which, if the practical results correspond with the theory laid down by any writer, there can be but little doubt as to the correctness of that theory.

In the present undertaking I have consulted the best physiological and philosophical authorities within my reach, Doctors Majendie, Prevost, Dumas, and many others acknowledged generally as being the highest and best known to modern writers—and the Comte de Buffon's theory on the growth and re-production of the animal and vegetable tribes; supported as those eminent writers are by their own, and those of other authors, practical experiments for particular purposes of illustration, and from the profound reasoning and argumentation which they display, I feel no hesitation in adopting the principles they have promulgated.

Then, in the practical results which my own experience and information supply for the purposes of this work, what applies to one sort of animal does not so strictly apply to another, as in the case of those animals destined for labour, the horse, the dog, &c., differ from those *not* destined for labour, as the sheep, the cow, &c. on some parts, of which a distinction is requisite to be drawn; again, the proof of perfection is not open to so accurate an illustration in one sort as in others; their capabilities and powers not being alike open to a test. The sheep—the cow—the draught horse—the hunter—the race horse—the hound—the pointer—the greyhound—yet the principle applies alike to all, and therefore the most certain criterion will be best drawn from that animal whose powers can be the most clearly defined. Such being the case, the race horse and the greyhound appear the most proper for selection, as being the most speedy, and their speed put to the test; but the horse is often weighted according to his known powers, to give a chance of winning to those whose powers are not known, or known to be less than the others, which leaves the criterion not so perfect in them as in greyhounds who are not weighted, and moreover left to their own control. I shall, therefore, direct my principal attention and allusions to the greyhound upon those subjects where the principle applies alike to all, contenting myself with occasional allusions to other animals where the necessity offers itself.

From the exercise of judgment in a judicious selection of Sire and and Dam, springs your future success in breeding, and your honour and glory as a courser; the same applying to the production of all other animals. A chance production may prove good runners; but where is the self satisfaction of your own merit or the admission of that of your brother Sportsmen in your producing them? From the breeding, the fostering, and rearing them to perfection, in all of which a true courser has infinite pleasure and delight, "to cherish and train up the greyhound to the chase," and seeing him run in that beautiful style which is so admirable in good greyhounds; you have unqualified satisfaction in your own mind, and the admiration, or possibly the envy, of your competitors; but if you bring a good greyhound to the field, who proves successful in his matches, or possibly wins a cup, that you have purchased for money, or has been presented to you by the hand of friendship, there is a damp on your own self-satisfaction at his success, and a reduction from your merit in the minds of others, because you *did not breed him.* Some one else claims, and is allowed that merit. "I," says one person, "I bred that dog;" "aye," and says another, "I reared him, and sold him to that gentleman."[1] "Oh, then," says a third, addressing himself to you, at the moment that would otherwise be your first moment of exultation, continuing your gratification and delight for many years, or perhaps for your life; but in this case only proves the moment of transient delight. "Oh, then, you did not breed that dog yourself," and probably adds, that "he would not give a farthing to win a cup, unless it was by a dog of his own breeding." I would much rather be a breeder of greyhounds to sell, than a buyer, even if successful in winning with them; the latter may do very well with those who course for "the lucre of gold," but the renown is purchased, and therefore not sterling; the former retains the sterling merit and renown, with probably the addition of a handsome profit in his pocket for his own care, attention, and judgment. But those who breed, rear, and train greyhounds, and finally are successful in winning prizes with them, are the coursers who will always have the greatest meed of praise bestowed on them by their brother sportsmen, and the most sterling pleasure and delight in their own minds.[1]

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[1] The cat is sometimes let out of the bag in this way, when a good greyhound creeps into an entry for a cup or stake that is not duly qualified according to the rules of a club, not having been long enough bona-fide the property of the member who enters him. The dog runs admirably, wins his courses, and is much praised; the breeder of him is on the ground, who, as has sometimes proved to be the case, was the real bona-fide owner, and in his exultation, whispers a friend, "that is my dog;" from him it goes to another, and so on till it reaches the ears of the owner of the defeated dog; an explanation ensues, when the dog is disqualified, and the member who enters him is disgraced in the eyes of the club, and chagrined and mortified in his own mind. Whether an attempt to disqualify a dog under such circumstances succeeds or not, it breeds enmity between those who were before very good friends, which enmity often continues for a long time, if it does not cause a final termination to their social friendship.

Splendid trophies of success, such as gold or silver cups, won by bought or borrowed dogs, are likened by some to the peacock's feathers in the fable of the daw and the magpie; and the courser who is anxious to win them, but cannot with his own dogs, notwithstanding his partiality and high opinion of them, may say, with the author of a poem on a disputed course,

> " I oft'times have thought that my dogs could have flown,
> Yet I ne'er won a cup with a dog of my own."

There is nevertheless very great difficulty on many occasions in making a judicious selection; yet the greater the difficulty the more the merit in success. Real good and true blood, good shape, fine speed, and all the indications by propensities and performances of honesty of breed, without which, in one and all these several qualifications united, a litter of really good puppies cannot be expected, and therefore all must be attended to. If you have good blood in both sire and dam, yet defective in shape or speed in either of them, which may or may not arise from a defect in the system of rearing; or if you have good shape and speed, without pure blood, you cannot rely on good puppies.

But by breeding them yourself I must not be understood to mean, that you shall selfishly confine yourself to both sire and dam being bonâ-fide your own property, to the exclusion of all cordial and social connection and exchange or partnership with your friends with the litters of whelps each may have. "No, God forbid," as Markham would say, "my purpose is merely contrary; I would not have you to go about to breed whelps from every bitch you have, at much trouble and expense, in rearing; and when old enough to be brought to their private trials against others, you find them wanting, and so inferior, that you have to beg, borrow, or buy dogs to win cups with, because your own are not good enough. But if, on the contrary, the sire belongs to you and the dam to another, or possibly neither of them to yourself, yet being a party to the selection, or in exchange for your own whelps, you obtain a brace from another kennel, and rear them, and they prove good ones, you share in the merit, as well as in the self satisfaction of having produced them. To be blindly bigoted to breeding from none but your own kennel, is the opposite extreme of purchasing when old enough to run, and found better than your own. Many a courser splits on the rock of prejudice in favour of his own to breed from. A dog or a bitch that has been kept, and which proves not very good in his or her running, yet being of known good blood, is fancied proper *to breed from;* when at the same time that want of speed or stoutness is from a defect in shape, which their own prejudice has rendered them too blind to discover. One probably of the worst part of a litter, which had been better, when blind itself, to have been "committed to the merciless flood, as a dwindling refuse," had it been possible at that time to discover its defects of shape; or possibly has become a bad one through bad rearing, which will affect its shape and powers in a material degree; and though the blood is still good, the shape is bad, and "like will beget like," or what is worse, the defect will generally increase in the progeny.

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[1] In the list of Subscribers I have the honour of classing the name of Mr. Hutton, of Marske Hall, Yorkshire, whose ancestor bred Marske, the sire of that celebrated race-horse Eclipse, of which a friend took occasion to inform me. Any animal who proves himself superlatively good, his stock superior also, there is a natural and universal inquiry as to *who bred him?* with a corresponding and laudable pride in the breeder, which descends to his sons and his sons' sons for many generations.

Another error is, you may by chance have a very fast dog, not of a pure or good breed, and breed from him with a well bred bitch; this, though you may possibly have a good puppy or two, will never do to go on with.[1]

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[1] A plain spoken old friend of mine, fond of coursing, and, in fact, to sporting in all its branches, but now long ago gathered to his fathers, used to say, "Talk indeed about there being no truth in breed; why you may as well put one of your best blood mares to a jackass, and think of having a fine stallion horse from her."

A medical gentleman says,—"To obtain the utmost perfection, there is a point which must not be overlooked. It is not only necessary that animals should be selected whose organization is of the most perfect kind; but it is also requisite that their organs should be well and duly exercised, in order to procure the fullest development of power and quality; and there is every reason to believe that in such a state of constitution they will propagate others of a higher order in respect of such attributes, than they would have done had they been kept in a state of indolence and inactivity. By way of illustration, suppose two dogs, equally well bred and equally perfect in form and organization, if one of them lead an inactive life, and his organs are only imperfectly exercised, and the other be placed under circumstances favourable to the exercise and fullest development of them, the offspring of the latter will have the best chance of superiority. The hand of a man who labours is much larger, stronger, and more muscular than that of one who never labours, and the hand of the son of such labourer will be larger and better developed, and better adapted for labour in consequence. Hence it arises, that families of ancient ancestry, whose progenitors for ages have lived in indolence, and have not sufficiently developed their muscular and bony structure by labour or robust exercises, are small in their bodily frame, and deficient in muscularity. It is not, therefore, sufficient in the case either of men or animals, if perfection is the object, that they should be *born* with a good organization only; but in order to possess the qualities thence arising in the highest degree, and to propagate and convey them to their descendants, they must preserve them by exercise in the most perfect state of development. To breed therefore in the most successful manner, the male and female should be taken when they are in the highest state of health, and when all the powers and attributes which are wished for, and which it is designed to propagate, are in the most complete order and state of perfection. This doctrine applies equally to the senses and mental faculties, as well as the bodily powers."

The Comte de Buffon, who has investigated these matters with the greatest care, and from whose excellent work I will glean what is material to my purpose, says—

" What a variety of springs, of powers, and of mechanical movements, are included in that small portion of matter of which the body of an animal is composed! What a number of relations, what harmony, what correspondence among the different parts! How many combinations, arrangements, causes, effects, and principles, all conspiring to accomplish the same design! But however admirable this work may appear, the greatest miracle is not exhibited in the individual. It is in the successive renovation, and in the continued duration of the species, that nature assumes an aspect altogether inconceivable and astonishing. This faculty of re-production, which is peculiar to animals and vegetables; this species of unity, which always subsists, and seems to be eternal; this generative power, which is perpetually in action, must, with regard to us, continue to be a mystery so profound, that we shall probably never reach its bottom. The power of reproduction is common to the two kingdoms, and is an analogy both universal and essential. This mutual faculty would induce us to think that animals and vegetables are beings of the same order.

" A second resemblance may be derived from the expansion of their parts, which is likewise a common property, for vegetables grow as well as animals; and though some difference in the manner of expansion may be remarked, it is neither general nor essential; since the growth of some considerable parts of animals, as the bones, the hairs, the nails, the horns, &c. is the effect of a genuine vegetation; and the fœtus, in its first formation, may be rather said to vegetate than to live.

" Considering organized bodies under this point of view, an individual is a whole, uniformly constructed in all parts, a collection of an infinite number of particles every way similar, an assemblage of germs, or minute individuals of the same species, which, in certain circumstances, are capable of being expanded, and of becoming new beings like those from which they were originally separated.

" This idea, when traced to the bottom, discovers a relation between animals, vegetables, and minerals, which we would not have suspected. Salts, and some other minerals, consist of parts similar to one another, and to the whole. A grain of sea salt, as we distinctly perceive by the microscope, is a cube composed of an infinite number of smaller cubes, which, as we discover by a large magnifier, are themselves composed of still smaller cubes. Plants and animals, which possess the power of multiplying by all their parts, are organized bodies, composed of similar organic bodies, the primitive and constituent particles of which are also organic and similar. Of these we discern the accumulated quantity; but we can only recognise the constituent particles by reason and analogy. From this view we are led to conclude that there exists in nature an infinity of *organic living particles* of the same substance with organized beings.[1]

" Nature produces these living organic particles without expense, because their existence is constant and invariable; that the causes of death disunite these particles, but do not destroy them. Thus the matter assimilated by an animal or vegetable, is an organic matter of the same nature with that of the animal or vegetable, and, consequently, may augment the size without changing the figure or the qualities of the original moulds; because it has the same quality and the same form with the matter of which the moulds themselves are composed.

" Organized bodies are nourished by the particles of aliment which are similar to them; they grow or are expanded by absorbing those organic particles which correspond to their own nature; and they propagate, because they contain some organic particles similar to themselves.

" We formerly remarked, that the organic parts of food were separated from those which have no analogy to the animal or vegetable, by transpiration and other excretions. The first remain, and serve to expand and nourish the body; but these organic parts must be of very different species; and, as each part of the body only receives a proper number of those which correspond to it, the surplus, it is natural to imagine, will be returned from all parts of the body, and be collected in one or more reservoirs, where they will unite and form small organic bodies, similar to the first, and which require nothing but proper circumstances for expanding and becoming new individuals of the same species; for, as all parts of the body send off organic particles similar to those of which themselves are composed, the result of their union must be the production of new organized bodies, similar to the original. Hence we may conclude, that this is the reason why organized bodies, during the time of their growth and expansion, are seldom or never capable of re-producing; because the growing parts absorb the whole organic particles presented to them, and no surplus being sent from the different parts of the body, propagation becomes, of course, impracticable.

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[1] These organic living particles, it will be seen hereafter, are what many writers term " animalcula."

" The expansion and growth of the different parts of man's body being effected by the intimate penetration of organic particles, analogous to each of these parts, all the organic particles, in early life, are absorbed, and entirely employed in unfolding and augmenting his different members. He has, of course, little or no superfluous particles, till his growth be completed. It is for this reason that infants are incapable of propagating. But when man's body has nearly attained its full size, he requires not the same quantity of organic particles; the surplus is, therefore, sent from all parts into reservoirs destined for their reception.[1]

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[1] It must, by no means, be inferred from this, that when man's body has attained either nearly its full size, or even past the age of maturity, that a great portion of the organic particles derived from nutrition, are not essential to the support of his body; even was he at perfect ease and rest, and no extra portion of his flesh wasted, or thrown off by perspiration from strong exercise, exertion, heat, or other causes; and that consequently the whole of the organic particles, derived from nutrition, would be thrown into the seminal reservoirs; for, it will be seen hereafter, that during life, there is a perpetual waste, a continuity of change, going on in the body; old flesh, skin, &c. going off, and new flesh, &c. forming by nutrition from food; and that this new flesh, in quantity and quality, is according to that of the food, and the attendant circumstances of labour or exercise The

These reservoirs are the testes and seminal vessels. At this very period, when the growth of the body is nearly finished, puberty commences, and every phenomenon attending it discovers a superabundance of nourishment.

" The organic particles sent from all parts of the body into the testicles and seminal vessels of the male, and into the ovarium of the female, compose the seminal fluid which, in either sex, is a kind of extract from the several parts of the body.

" These organic particles, instead of uniting and forming an individual similar to that in whose body they are contained, as happens in vegetables and some imperfect animals, cannot accomplish this end without a mixture of the fluid of both sexes. When this mixture is made, if the organic particles of the male exceed those of the female, the result is a male, and if those of the female abound most, a female is generated."

Buffon, by what is elsewhere said, does not here mean, that the abundance of *seminal fluid* in either sex over the other, will determine whether the new individual shall be male or female, but the quantity of *organic particles contained* in the *fluid*, which governs that event; and this is also influenced by the maturity or immaturity of those particles dependant on the state of health, or condition of body, maturity or immaturity of age, and also that of those particles from the season for breeding peculiar to some animals, the females in particular, for on those and other circumstances the strength or power of those organic particles, depend.

It will also be found that, as there are no surplus organic particles to supply the seminal vessels till the age of puberty, so is there a difference in that respect between the first age of puberty and that of perfect maturity, while the body is undergoing

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same applies to the growing body; the particles derived from food which penetrate into the organs, and expand them, have not only to replenish what is thus continually wasting, but also to expand, or enlarge the body, which is only another word for its growth.

its perfect and full development, as a portion of those organic particles are required for that purpose, consequently leaving a greater surplus of them after full maturity than before it, to supply the seminal reservoirs; when the body is perfect, then those organic particles are matured and ripe, and consequently more powerful.

This full growth and perfect development to give the body the most power, is not dependant on nutrition alone; it requires the organs and parts to be duly exercised and strengthened in its growth; and as the power of the body is influenced by that due exercise, so is the power of the extract from the body to supply the seminal reservoirs more or less powerful according as the body has been duly exercised or not.

Buffon says, that " these organic particles are governed by the laws of affinity and attraction; those which are most analogous to one another will unite in the most intimate manner; that each part of the body will appropriate those which are most agreeable to its nature; and that the whole superfluous particles will form a seminal fluid, which shall contain all the organic particles necessary for forming a small organized body, similar in every respect to that from which the fluid is extracted.

" The formation of the fœtus is effected by the mixture of the organic particles of both sexes; this mixture gives a local establishment to the particles, because it is made according to the laws of affinity which take place between the different parts, and which determine the particles to arrange themselves in the same order they observed when they existed in the individuals who furnished them. The particles which proceed from the head, for example, cannot, according to these laws, take up their station in the legs, or in any other part but that of the head of the fœtus. All the particles are in motion when they first unite; and this motion must be round the point or centre of union. This basis or central point, which is necessary to the union of the particles, and which by its re-action and inertia, fixes and destroys their activity, is probably the first assemblage of particles that proceed from the sexual parts, because they are the only particles in the mixture which differ from those common to both sexes.

"These are the only particles of both sexes which do not mix, the others common to both sexes mix promiscuously; we daily perceive children with eyes resembling those of the father, while their mouth and front resemble those of the mother. But we never see any such mixture of resemblances in the sexual parts; we never find in the same individual the testicles of the father, and the vagina of the mother.

"In the mixture of the two fluids, the organic particles which come from the sexual parts of the male, fix themselves first, and cannot unite with those which proceed from the sexual parts of the female, because they are of a different nature, and have less affinity to each other than the particles that come from the eye, the arm, or any other part of the female. Round this centre, or point of union, the other organic particles successively arrange themselves in the same order they formerly existed in the body from which they were derived; and according as the particles of the one or of the other individual most abound, or are nearer this central point, they enter in greater or less quantities into the composition of the new being, which in this manner, is formed in the middle of a homogeneous fluid.

"When the quantity of seminal fluid in both individuals is great, or rather, when these liquors abound with organic particles, different centres of attraction are formed in different parts of the mixture; and, in that case, by a mechanism similar to what has been mentioned above, several fœtuses are formed, some of them males, and others females, according as the particles of one sex or the other are most active."

Now, this extra activity in the particles of one sex over those of the other, must have a cause, or rather, a variety of causes may occasion it; sometimes one, and sometimes another, or at other times a union of two or more causes may occasion it; these particles from the sexual parts which form the basis, or centre of attraction, must be very materially influenced by the state of the whole body of which they form an integral part; and when there are a number of new individuals formed, as in the dog species, if the number of males and females are about equal, we may rationally conclude that both parents were in nearly the same state of health, maturity of age, perfectness of muscular and bodily development, and maturity of fitness for procreation; by the same rule, when the number of males or females much exceed the other, there must be a defect of some attribute in the parent of that sex of which there are the least number. This must be borne in mind when we come to consider the questions, of which there are three important ones, relative to putting a bitch at heat to the dog; namely, a bitch before she is at mature age; or at any age, whether to put the dog to her more than once; and at what period or stage of her heat. At present I have another object in view, which is relative to the selection or choice of male and female to breed from, and also relative to what the medical gentleman before quoted states with respect to the perfect or imperfect development of the whole bodily structure by proper exercise of its several attributes.

Buffon says, "the back bone is the foundation of the animal frame; and the action and movement of most members of the body depend upon the spinal marrow which that bone contains. It is this part also, together with the head, which appears first in the embryo. Now, these simple parts which are first formed, are all essential to the existence and form of the animal.

"The spinal marrow, and the vertebra in which it is enclosed, appear to be the real axis of all the double parts of the animal body, from which they seem to derive their origin, and to be the only proportional branches issuing from this trunk or common base; for in the young chick we see the ribs shooting from each side of the vertebra, as the small branches shoot out from the middle branch of a tree. In all embryos, the middle of the head and the vertebra first appear; we then see, on each side of the vesicle which composes the middle of the head, two other vesicles, which seem to proceed from the first; these two vesicles contain the eyes, and the other double parts of the head. In the same manner, we perceive an equal number of small tubercles issuing from each side of the vertebra, which gradually extend, and form the ribs, and other double parts of the trunk. Lastly, the arms and legs appear like small tubercles on each side of the trunk. This first growth is very different from what afterwards takes place; it is the production of parts which appear for the first time; the growth which succeeds is only an expansion of parts already formed.

"Hence we may conclude, that if there be any *defect*, or *redundance* in the *matter* destined for the formation of the double parts, as the forces are equal on each side, this defect or excess must take place both in the right and left sides. If, for example, from a defect of matter, a man has but two fingers on the right hand, in place of five, the same defect will appear in the left; if from an excess of matter, there be six fingers on the right hand, he will have the same number on the left; or if the matter be vitiated, and produces a change in the parts on one side, the same change will appear in the other. Of this fact we have daily proofs; the parts of monsters are always deranged in a certain order and proportion."

I have a child now in the room, daughter of a neighbour, who has two thumbs on each hand; each similar to the other; they only separate at the joint nearest the hand, but that joint appears to have a division in the middle, and to be a double joint; they then, on each hand, both alike curve outwards a little way, and then turn and meet each other at the nail. A deformed person whom I know has a redundancy on the right shoulder, and a corresponding one on the left hip; this uniformity of deformity is common in most deformed people.

Now does not this able exposition of the Comte de Buffon, of the elementary matter in re-production and growth of the fœtus, clearly explain the cause of what we so often, and so commonly experience, to be the effect from any one or more imperfections in either parent, unless there be a redundancy in the corresponding part of the other, that defect is clearly observable, and generally in an increased degree, in the offspring? Does not this circumstance alone, of the defect increasing, prove to us, that to produce perfection there must be perfection in every attribute in both the parents? That perfection alone can be get perfection; that anything short of it in any attribute will cause deterioration? And does not this consideration include, amongst the rest, that there must be no defect in nutrition to support the body, nor in exercise or exertion, to throw off the superfluity, and to strengthen the parts? The exercise strengthens the parts in a two-fold manner, by expanding and fully developing them, and by throwing off the superfluity, the animal lives and is nourished by the best and finest portion of the nutrition unencumbered by the inferior.

Buffon says, " as women are smaller and weaker than men, as their constitutions are more delicate, and as they take less food, it is natural to think that their superfluous organic particles should also be less abundant; of course, their seminal fluid will be weaker and smaller in quantity than that of men; and since the fluid of females contains fewer organic particles, must not a greater number of males than of females result from a mixture of these two fluids? This is really the case; and the number of males born exceeds that of females about a sixteenth part; and we shall afterwards see that the same effect is produced by the same cause in all the different species of animals."

Now is not this cause and effect perfectly analogous to one male or female being stronger than another, and producing stronger offspring from the strength of the parent's muscular and bodily structure being increased and more perfectly developed by exercise and exertion, than by ease and indolence? The objectors to this doctrine will not readily controvert Buffon's hypothesis and corresponding result.

But this hypothesis is still further confirmed by the difference in strength of the right and left hand, according as the right or left hand is more exercised than the other in infancy, and also according to the superior strength of one hand over the other in the parents.

In allusion to one hand having only two fingers instead of five, the other hand will only have two, from a defect of matter, and the same by an excess of matter each hand alike will have six fingers; this hypothesis, it must, and ought to be particularly observed, is founded on the supposition of the matter destined for the formation of the double parts of the fœtus, or " *the forces being equal on each side.*" If, therefore, the right hand of the parent is stronger than the left hand, *the forces are not equal* on each side. It does not follow from this, that if the parent's right hand is stronger than his left, that the right hand of the offspring must therefore have six fingers and the left only five; but it follows as a natural consequence that the right hand of the offspring will be *stronger* than his left hand.

The truth of this position is clearly exemplified by the difference of strength and activity between the right hand and the left, in those who usually exercise the right hand in preference to the left. I am aware that different opinions are held on this subject; some ascribing the extra strength of the right hand, arm, leg, and even side, to a difference in the natural structure of the right side to the left, and to some particular vein which is found in the right side that is not in the left. It is quite immaterial whether such a peculiarity of structure exists in the frame generally or not, as the evidence from those who are left handed, as the term is, will upset that position entirely; for where one man is accustomed to use the left hand in preference to the right, his left hand is as much more strong and handy to use than his right hand is, as the right hand of another man that uses it in preference, is stronger than his left hand; which would not be the case if any peculiarity of structure existed in the right arm or side generally which gives it more strength.

A right-handed man uses his right hand and arm more frequently than he does his left, and particularly in those efforts requiring most strength and force, and has done so from his childhood upwards, which unquestionably brings it to a more perfect state of development, and gives it more strength. He is probably taught by his mother to do so; but if that happens not to be the case, if his parents were right handed, he does so naturally, from finding it stronger, and the fingers acting with more facility. The same applies to the left hand of the offspring where the parents are one or both left handed, of the truth of which I have accidentally met with a strong and conclusive instance.

Mr. Hazlehurst, an eminent land surveyor, of Chesterfield, who is left handed, informs me, that his left side is altogether stronger than his right; his family are most of them left handed, and have been for several generations back; and his son is also left handed. Now here the extra strength in the left side over the right is inherited from the parents generation after generation, and the preference given to the use of the left hand in *opposition* to the orders or instruction naturally given by the mother in their infancy to use the right hand, which proves the offspring inheriting the strength from the parents' strengthening themselves by exercise or exertion.

Some would consider this as merely an exception to a general rule, and as being hereditary; others consider it a *mere* matter of custom; it, in fact, partakes of both; it is strictly in character with the general frame being affected beneficially or prejudiciously according as it is on one hand accustomed to exercise and labour, or on the other, to ease and indolence; it is as strong a confirmation of it as can be had, or as need be required; in families of ancient ancestry there are many causes contribute their portion in unison with each other in producing diminution of frame and stature, yet three especially; ease and indolence, marriages amongst relations, and dissipation; it would be difficult to say which is the predominating cause of that effect. The same difference is observable between greyhounds; those reared in kennel and many of them together, and those reared one at a house; the latter takes his exercise his own natural way all day; the other cannot well be managed to do so, there is also difference in the food and mode of feeding, and other causes conspire so as to render it difficult to fix upon any one predominating cause or even if some of these causes have *any* effect towards it. If, however, there should be any doubt of want of exercise and exertion being one of those causes, and there are many who doubt such cause affecting the offspring from their parents' want of it, this *left handed argument,* for so it may truly be called, will remove that doubt. The argument is not less strong, for being a *left handed one;* on the contrary it is more strong than the argument would be if maintained on the subject of the right hand and arm being generally stronger than the left; and yet that increased strength in the right hand generally is a proof in favour of my medical friend's position, as that increased strength is derived from the same cause; and in either case, the sides are uninfluenced by any difference of feeding or other considerations; they are alike in all, though the custom of teaching children to use the right hand, renders the greater strength in that right hand not so conclusive an argument; the instance afforded by Mr. Hazlehurst's family shôws that the children's sense of more strength, and facility of use, in the left hand than in the right, prevails over, or in opposition to the orders and instructions of the mother or tutor as soon as the child is old enough to have a knife and fork or spoon laid before it to eat its victuals with; the knife invariably being laid on the table for, or the spoon put into the right hand.

It is certainly custom which induces the use of either hand in preference, to a certain degree; but it is not *all a mere matter of custom;* it may also be hereditary for two generations or five, or ten; but whence was that derived? Not in a different organization or creation from old Father Adam. Some ancestor, when a child, possibly had an accident, and injured the right hand, and could not use it for a length of time; the left hand was of necessity more in use, and gradually became stronger, while the right hand relaxed, and did not grow with its growth, and strengthen with its strength, equally with the left; hence *custom* brought the left hand into more frequent and general use, continuing as the child grew up to strengthen the whole of the left side from the muscular connexion, more than the right; this difference of strength is conveyed to the offspring in the next generation, and so on generation after generation.

The father may be left handed, and the mother right handed; this would produce a difference in the children in that respect; but, as usual in both the human and brute species, the offspring in their peculiarities of propensities and powers take after their parents, according to the sex; so would the sons in this case be more liable to be left handed than the daughters; in that there may be some variation, but it is an admitted axiom that the power in the seed of the male predominates over that of the female.

This instance, or rather, this left handed argument, tends to confirm another point which is elsewhere alluded to on the subject of exercise and exertion; namely, that by forcing with food you may produce muscular and bony substance in quantity, but not in quality without congenial exercise; you will not obtain such firmness of muscle or solidity of bone without exercise and labour as with it, though you may have the same apparent substance; nor so good a constitution. The difference in size between the right and the left hand, arm, or side is scarcely perceptible, if at all, to the eye; yet there is an evident and an acknowledged difference in the strength of the two, and some little difference in size also, though not perceptible to the eye; if you buy a pair of gloves, the seller offers you the right handed glove to try if it will fit your right hand; and they do this because it is generally found, that if the glove is large enough for the right hand, the left handed glove, being of the same size, is sure to be large enough for the left hand; this being so generally known to be the case proves that the right hand, with those who use it most, is some degree larger than the left.

Being accustomed to use one hand in preference to the other may give an increased facility of action to that hand and the fingers of it over the other hand; but it is the greater strength in that hand more than the other with which the child is born which causes it to accustom itself to the use of that hand in preference; the greater natural strength is the first cause; the facility of using it, is the effect of that first cause.

I was particular in my inquiries of Mr. Hazlehurst, who has allowed me to give his name in confirmation of these facts, as to how far any endeavour has been made by the mothers or nurses to induce the children to use their right hand in preference to their left, and he says that he has himself suffered correction, or to use his own words, has been flogged fifty times on the subject, and his left hand often tied behind his back to prevent him using it, and compel him to use the right hand; and that every endeavour has, in vain been used with his own children. His son has persevered a long time in endeavouring even to mend a pen with his right hand, but cannot succeed to his satisfaction. He has himself tried the difference in strength between the right hand, arm, and side—and his left, by lifting weights, and the difference in the proportion of strength is as eight to seven; those weights of which he could lift eight with his left hand, he can only lift seven with his right.

As a further proof of superior muscular power in his left hand, arm and side, over that of his right, he informs me, that when near fifty years of age he was afflicted with a severe attack of rheumatic fever which left him crippled of both hands, so much so that he could not shut either of them; the knuckles and joints with the membraneous and cartilaginous parts were become ossified; to molify which he immersed himself in steam baths, and in the second bath, by the superior strength of muscle in the left arm, he was enabled to overcome the ossification in the left hand, the knuckles and parts of which he would perceive crackle during his exertion for that purpose; but although he was fully as anxious to effect that with his right hand as his left, and used every exertion in his power, he could not succeed, at least, to such an extent with his right hand and arm in subsequent baths, as he did with his left in the second bath; he cannot now shut his right hand above half way, while with his left he can grip his fist quite firm and strong.

His mother was left handed; so was her father and her grandfather; they were both carpenters, and both used the axe with the left hand, although they persevered a considerable time in endeavouring to use it with the right hand, but in vain. They were, however, not likely to succeed, as at the age they were fit to be put apprentice to this handicraft work, both the superior muscular strength of the left hand over that of the right, and also the habit of using the left in preference to the right, was more fully confirmed, than in their days of infancy, and consequently more difficult, if not impossible, to counteract.

Those who are right handed, and have been for generations, are stronger in the right hand, arm, and side, from the continuation of muscular connection, than in the left, in similar proportion, to those who are left handed for a like number of generations, which makes twice the difference, and altogether forms a very conclusive proof of the strength of the offspring in either side being influenced by that part of the parent; and as the same principle which applies to one limb applies equally to the whole body, it shows the absolute necessity for proper exercise and exertion whilst young, as conducive to a perfect state of development of the muscular and bony structure. This is strictly applicable to the difference we experience in the goodness of greyhounds between those reared in a confined situation where they cannot take proper exercise, and those reared where they have plenty of room to gallop and scope about and stretch their limbs and muscular fibre, and to strengthen their parts which have to support their stature, giving ultimately the greatest powers of speed and duration as well as constitution. Another analogous proof of the necessity for exercise in the parents during their growth, to produce substances and strength in their offspring is seen in the difference in the produce from greyhound bitches who have not bred puppies before arriving at mature age, to those which have bred before that time; they generally are stronger from the former than from the latter; the muscular and bony structure is more perfectly developed in one than in the other, before they breed; but more of this hereafter.

Now these apply in a manifold manner to the rearing of all animals, and those in particular that are required for labour and great exertion, and confirm many points which I had previously set down, as will be found in that department of this work; but I introduce them here, as they also apply to the selection of male and female to breed from, and as they show the uncertainty and difficulty of judging the effects from in-breeding where there are so many different modes of rearing in practice by breeders.

These remarks apply to other animals besides greyhounds, and in principle to all animals alike, but not in detail or the same ratio and precise manner; for instance, those required for labour and great exertion as dogs, horses, or men, on the one hand, and those not required for such labour and exertion, as sheep or cows, which are wanted to feed, milk, and breed from, on the other; the development of whose faculties and powers are requisite to be pushed to the greatest perfection, but in a different shape or manner to the horse, or dog, or even man. They, the cow and sheep, are alike required to be in good health when the male is put to the female for breeding, and to have been fostered in their youth so as to reach their full measure of stature, or their offspring will be more diminutive than themselves in size and substance; and if they have not a sufficiency of good and wholesome food when young and in a growing state, they will themselves not reach their full measure of stature to convey that to their offspring. A cow bred for dairying, and to breed others for that purpose, should not be imperfectly milked, but her milking faculties exerted to their fullest powers, or she will give a less quantity of milk, and sooner become dry, and will breed such as will give a less quantity of milk than if their mother's faculties had been fully exercised. This is in exact analogy to a horse or dog having their muscular and bony structure fully developed by proper exercise, during his growth as well as when arrived at a mature age; hence a stallion horse, kept at home for the purpose of covering mares, and not taken out for sufficient exercise, seldom gets so good stock as those which are properly exercised, or those which travel for the purpose; and if they did not undergo sufficient exercise when young and growing, it will double the disadvantage. A bull or cow or sheep does not require much exercise, as that is not their natural element; and a young horse at grass will take a good portion of exercise of his own accord, and thus gradually develop his muscular and bony structure towards perfection, but if prevented by accidental lameness from doing so, or obliged thereby to be kept in the stable, he is sure to be deficient in those muscular powers and to convey that deficiency to his offspring. I know a horse who broke his leg in running a race when three years old, and has since been kept for covering mares, not being capable of any thing else, or even of travelling for that, but his stock are not promising, though he is exceedingly well bred, of a good size, and not deficient of good general shape.

This doctrine is however disputed by some, inasmuch as they say that full development of their powers is not a necessary consideration for breeding; where there is no natural defect in the parent there will none follow, as a necessary consequence, in the offspring; nature, they say, will have its course, and if it has its uninterrupted course, there will be no defect. Such arguers do not appear to consider that if the animal has not his natural exercise and labour for which nature intended him, and his natural powers fully developed thereby, *nature* cannot be said to *have had its regular and natural course,* and therefore their argument is totally indefensible. There are a great variety and multiplicity of reasons why the truth of the matter is seldom clearly demonstrated by actual experiment, so far as regards only one generation, though that experiment may be made by many different breeders and with animals of different kind which with all their various ways of management, tends to increase the difficulty of deciding upon. An actual deficiency may exist in the first generation where there is a defect in the parent, yet not be sufficient to be perceived or visible to the eye; but where that goes on for a succession of generations, and the result proves as stated by the medical gentleman before quoted, that families of ancient ancestry whose progenitors have for ages lived in indolence, are so small in their bodily frame as to be obvious to us all, and that a succession of generations producing that effect to be evident and to a great degree proves that for one generation only, the effect is *actually produced,* though it may be in so small a degree as not to be quite obvious. So that where perfection is the object, and where is perfection not the object in the breeding of greyhounds? a bad effect to a *certain degree* will be produced by one, and only one, injudicious cross.

There are occasionally instances of dogs, horses, or men, of such extraordinary powers of strength or speed, or other faculties, some of a peculiar nature, as to be far above the generality of the same species, or what is considered the best of individuals of each of those species. When such is the case, and under no peculiarity of circumstances, we may rationally conclude that there was a union in perfection in the natural formation of them, with that of proper fostering and bringing up, and that a full development of all their powers has taken place with both them and their progenitors for ages, the males and females both being in the highest state of health and vigour at the time of copulation.

It is from the want of this unity of perfection in all the attributes that so much degeneracy is observable in the breed of all descriptions of animals under the control of man, and of man himself; and it is from the same cause that the highest standard of excellence is so rarely attainable; and if to this is added, the breeding from too great nearness of consanguinity, the deterioration is greatly increased. It is from this that the produce from very superior males, in speed, size, shape, and bodily powers united, are so much better than the produce from more inferior males, the highest standard of excellence in all the attributes absolutely necessary in them in particular, as the seed of the male predominates over that of the female, and verifies the remark of Arrian, that "a real good greyhound dog is a treasure which falls to the lot of but few men, and for which he should sacrifice to Diana Venatrix."[1] The deficiency from the want of this standard of excellence in all the attributes, is in a variety and multiplicity of shapes; perfect in one attribute, and imperfect in others, some more and some less so, some in one respect and some in others, that we have deficiency in all manner of degrees.

But although perfection in the male is, if in either, more necessary than in the female, yet the latter should be as perfect as possible. We may see this in the human species and in horses more than in dogs; the latter generally taking exercise of their own accord and exerting themselves if at liberty; yet we are not without instances in them which strengthens, and indeed confirms, this position; and shows the necessity of both male and female undergoing proper exertion while young and growing; I have seen greyhound kennels for puppies of three, six, nine, or twelve months or more old, very nice and neat little places they are for tame rabbits or cats and kittens to hop and jump about in, or sit on their haunches, washing their faces and wiping their noses with their fore-paws; an open yard of nine or ten feet square, the floor paved with flagstone, and secured from interruption by their enemies, the dogs, or themselves getting out, by iron palisading, a kennel to go in and out at pleasure, nothing could be more fitting for rabbits "or such like," as Gervase Markham would say; but for greyhounds to be reared in such places, who require room to gallop and scummer about, to stretch their muscular fibre, and strengthen their limbs and parts, is perfectly futile towards perfection, nor need we wonder at such rearers of greyhounds finding their choicest puppies beat by the neighbouring farmers' dogs, of whom it is said, and generally speaking, truly said, that "farmers have the best of greyhounds" of whom such rearers have to beg, borrow, or buy dogs to adorn their own sideboards with cups and other splendid trophies of success, notwithstanding they themselves may breed half a dozen litters of whelps in every year. Such we know *is* the case, and therefore it is not making "much a do about nothing" to caution others against such ineffectual modes of rearing their greyhounds.

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[1] As the seed of the male is known to predominate in strength over that of the female, supposing all other contingencies to be equal in both sexes—as good greyhound bitches abound whilst a real good greyhound dog is rarely met with—which will be more fully seen hereafter—and as males of all species are known to require a longer time than females for their full growth, and capability for procurating perfect species, it is probable that a greater and more common error is committed in breeding from dogs than from bitches when too young, and will justify a suspicion that even Buffon has not carried his distinction between the two so far as circumstances will warrant; and that if greyhound dogs were not used for serving bitches until, for example, they were five or six years old, at which age, under the common system, they are getting past that duty, whether they would not produce a greater number of superior dogs than they now do without any deterioration in the goodness of bitches—that both sexes will continue running good ones for more years than they now do in general, and afterwards breed better stock. The same applies to all animals.

We see the effect in the human species as before mentioned; but in them the defect is more frequently from the female than the male, and is a natural consequence of too great a refinement of delicacy; it is held *masculine* for the females to partake of field sports in these modern days; and those in high life are kept whilst young and growing to their needle, books, and music, but the latter not attended by the merry dance so much as it ought to be; some few mount their palfreys for a gentle ride, seldom going on foot above a mile from home, substituting the close, warm, and easy carriages, so that their muscular and bony structure are not developed to any perfection by exertion. We constantly now a days see these females, delicate and diminutive in stature, whilst the farmers' daughters who take an active part in the dairy and household affairs, and the daughters of the labouring and working class are fine, healthy, strong, buxom lasses.

I should like to see a coursing field well studded with ladies' riding habits, their own pretty faces with rosy cheeks, and mounted on their gay nags, bracing themselves with the heath or mountain air, and enjoying the sport as we read of them hawking and hunting in the olden days. Now the males of these high families do strengthen, and probably make the best of their *natural born* frame, by athletic exercises and exertions; but that will not completely remedy the defect from a mother brought up in indolence and ease; they may be well reared, but they may be considered as only *half-bred* towards producing strength and stature; they generally, and laudably from some considerations, do not marry with those of a lower station in life than their own, but intermarry with those who have been reared and brought up like their own mothers, which may be considered a species of in-and-in breeding, though not of consanguinity; in some cases that consanguineous in-breeding is added to the other defect; this continuing generation after generation, our gentry are degenerated in stature and muscularity.

I know a farmer now about sixty years of age, who was thought by his neighbours forty years ago to be *working himself to death*, as they considered his complaint to be, though nothing but an ordinary cold; he however *worked through it;* he worked as well as he could while unwell, and he recovered; and after beginning with scanty means has worked himself into possession of about one hundred acres of his own land free from encumbrances.

He is of a middle stature, but thin; his sons and daughters also of a middle stature, but robust, muscular and strong; their mother was remarkably small and thin; but mark, she was a hard worker. Her brothers are remarkably small, but at the same time are hard workers, and the children of the one that is married have every appearance of becoming nearly twice the weight of their father, their mother being only of middle stature.

A comparison of the blood horses of the present day, with those of the heavy black draught horses, will furnish another proof of the necessity of exertion in the young and growing; blood horses are trained and raced to prove their speed and powers before their fame is established to recommend them as stallions; and the mares are also worked; their breed is not considered as so degenerated; not so, the heavy black cart horses, I do not mean those which are crossed, as many are now, with a lighter or half-bred sort, for *every* one whom I have consulted about them, and they have been experienced in the craft all their lives, consider them to be *very much degenerated within the last fifty years;* here the defect begins on the part of horses, the mare being worked from two or three years old; a colt likely to make a good stallion is forced with plenty of good food to make him as large in substance as possible, but *not worked,* except in very few cases; and to increase the defect, he is put to covering mares, before he is got to maturity of age; some, it is true, are travelled for that purpose, but merely carrying their own weight from place to place, by easy stages, is not like working and drawing heavy loads, progressively extending their capabilities and powers; the produce from these are put to others bred and reared in the same manner, from generation to generation, which in time shows a great defect, though in one generation it is scarcely perceptible. Such will on the contrary, be the beneficial effect for one or a few generations if a different system is adopted, yet that effect not perceptible to the eye; but that ought not to discourage the breeder from perseverance, as, in time, he will find a great improvement in his cattle.

I will add a remark of an extensive and long experienced breeder of cart horses, when speaking of foals or yearlings in the winter; "don't you *house* them," he says, "we have put them sometimes in a spare barn or other vacant building, and they have come out towards spring spindling gimmer weedy things in comparison to those that have been foddered and kept out of doors." Surely the reason is obvious; the want of their natural exercise.

This is only a leaf out of the same book as not working them when a little older, and all this strictly applies to greyhound puppies being confined too much and not having plenty of room to take their natural exercise.

With exercise, their parts, by being strengthened are thickened, and consequently the nutritive particles which penetrate into the parts, are employed in the expansion of thickness, therefore fewer of them can be employed in the expansion or growth in stature. But without exercise, more of those nutritive particles are directed to the expansion or growth of stature, consequently less in thickness.

The degeneracy of the human species in high life is marked by another distinction of comparative results, from those of the heavy draught horses, be they of the black, brown or grey breed: in the former, dissipation and indulgence in luxurious eating and drinking to excess, and their concomitant disorders, are auxiliaries to diminution in stature and strength of bodily frame, by which their offspring will be injured. In the draught horse there is nothing of this; his growth in height and strength of frame is promoted by good plain feeding, and the males not being worked, that stature is not supported by firmness and muscularity; they are sluggish, heavy, and inactive; with difficulty dragging their own body and limbs along, while some that I have seen many many years ago,

> " To have seen what I *have* seen; see what I see."

Are robust and compact, short legged, and as nimble as a pony in comparison to the generality of the present race.

The surest indications of a true bred greyhound are to be seen more in their propensities and shapes than in their bodily powers; their true and fair running and their gallant dart through the meuses instead of showing a naturally crafty disposition. Good blood will do *great things*, but it cannot do *every thing* wanted, without other requisites; a judicious selection in sire and dam, of speed, and shape suitable to each other, well fostered and nourished in the rearing, and all their faculties and powers developed by proper exercise; without these the breed will degenerate, and hence it is that many are disappointed in the produce from a dog or bitch of a well known good breed, thinking that if they have good blood they will do to breed from, though they have not distinguished themselves much in their performances. This is a very erroneous fancy; a worse bred dog, well nurtured and brought up, will beat them as a *good* cock tail race horse will often beat a *bad* thorough bred one. Great part of the stoutness inherent in fine good blood is depreciated for want of its necessary auxiliary, muscular and bodily strength being fully developed.

As the same question which more particularly applies to rearing and training, also applies to the choice or selection of sire and dam to breed from, the offspring being so materially affected by the constitution of the parents from those parents and their progenitors being properly or improperly reared both in food and exercise, I will here briefly allude to the facts demonstrated by the repeated experiments upon dogs by the most eminent physiologist we have, Dr. Magendie.

It is well known that change of diet begets appetite; but it does not appear to be generally known that such change of diet is absolutely necessary to health, or in some cases to a certain degree, even to life itself. That this is not generally known is proved by the effect upon greyhounds, and the difference in their goodness between those where the inmates of a kennel are very numerous and others reared where there is only one, or very few, reared at a house.

Magendie has fed different dogs on different substances, confining each dog to only one substance, with water to drink; as much of each as he will eat and drink, and as often in the day as they like; of one substance they will die in thirty or thirty-five days; of another in forty days; others in forty-five days; and even pure wheaten bread, of which he seems to have tried more experiments than on any other substance, they will die in fifty days; confine them to it for forty days and then give them a change of food, they will eat it voraciously for a day or two, but will die at the end of fifty days the same as if they had received no change of food whatever, and when opened, present all the well known marks of final decay; whereas other dogs fed of these same substances simultaneously or successively, they live, and are in good health and condition.

The best greyhounds are generally found to be where there are the fewest kept at one house, while, where there are a great many, though of course so much greater choice, they are very often found inferior in speed and powers to the others.

This difference is observed and acknowledged by most coursers, and various are the speculative reasons assigned for it; no doubt there are many reasons, which combined and all directed to one general effect, render that effect so conspicuous as to call forth such general observation of the fact; they are however, to take all the reasons assigned, so diversified by a greater or less degree of their several parts differing in one house in some respects from another, and again in others differing in other respects, that a general conclusion cannot well be arrived at by taking all and every one of these several reasons into account. I would therefore confine the inquiry to three points especially, proper or improper exercise, a change or sameness of diet, and that congenial or uncongenial to their nature.

If one greyhound only is kept at one house, he takes his own exercise his own natural way; and if in health, he takes that exercise at all parts of the day, and has the entire range of the yard, croft, or other places for that purpose, and the fire side to lie down in the house when he is disposed; of itself no trifle to the dog species, and particularly to the greyhound. If you have five or ten brace at one house, this liberty given to only one puppy is in many respects inconvenient and troublesome, both when whelps and when grown older, and they are deprived of a portion of their liberty. This is the most difficult point of any of the three to be got over. I know different kennels where they breed and rear a numerous litter of greyhounds most years, where the system is similar in the other two points, but in one kennel the puppies have much more liberty than they have at the other; the latter produces the worst greyhounds when at maturity, generally speaking, but both defective; for being similar under the other points of management, when a coursing meeting arrives, with perhaps ten brace of running greyhounds in each kennel, and to send five brace each to the meeting, they often find themselves under the necessity of sending to their friends to each of whom they had given a puppy or two of the same litters with those in their own kennel, keeping as they think the best themselves, and amongst them collect about half the number they mean to send to the meeting; sometimes nearly all, leaving their own idle at home. The two other points of management contribute to the deficiency of those reared in their own kennel; but I mention the in this place, because though in both kennels there is a deficiency of exercise, yet in one kennel the puppies have more liberty than in the other, and that other has generally most occasion to have recourse to this, I may say, recruiting for foreign aid, to muster up sufficient force of first rate troops to meet the enemy in the field.

It must be remembered that size in stature and apparent substance, do not of themselves constitute firmness of muscular and bony structure which gives the greatest strength; even the bony portion of the frame may be large, yet without its proper firmness and solidity it is not so strong; congenial food and exercise in plenty must conduce to their "growing with their growth, and strengthening with their strength;" without this, and forced with unnatural food, you may have a fine showy dog on the outside, yet nothing sterling or really good within.

It was observed to me by a very celebrated courser, and experienced breeder of cattle, conversing on the necessity for greyhounds to be well reared, as indispensable, to their eventually proving good ones, at which he *puffed,* and said it was not the rearing which made them so; but that to be really good ones, *they must be born good ones.* True, O king! for as Gervase Markham observes, "where there is any imperfection at all, there nature will never be complete." If, therefore, it is necessary for them *to be born good ones,* does it not follow, and make the necessity more strongly appear, that the constitution and structure of the parents is indispensably necessary to be as perfect as possible, to render the offspring perfect? If he is *not born a good one,* you cannot make a good one of him; no one will doubt the correctness of that position. But can any one doubt, that supposing him to be born ever so perfect, that his constitution, and every good quality inherent in him, cannot be injured, or utterly ruined by improper rearing? To have a perfect good greyhound, you must have him born a *good one*, and *kept a good one*, by good and proper management; and this applies equally to his producing a perfect offspring as to his own powers and performances.

The next point after proper exercise is a change or sameness of diet. If one dog is kept at one house, the family have more or less a change of food most days; beef one day or two; mutton another; veal, pork, bacon, and vegetables of different sorts, sometimes one and at other times another sort, potatoes, turnips, carrots, or cabbages, and the dog comes in for his *snacks* of each, even though he may have more ordinary food as a standing dish for himself, when there may be no oddments of other food for him; and if at a farm house, he has so much greater variety of aliment—milk, buttermilk, cheese crushings, or whey.

Where there is a numerous kennel of greyhounds, there is one uniform food for them day after day, week after week, month after month, and year after year, though that food may consist of two or three sorts, yet it admits without difficulty or expense of a congenial change, but which change appears hitherto not to have been by coursers considered necessary, or even thought of. Horse flesh boiled down to rags, to have the nutriment principally in the broth, thickened with barley or oatmeal, and bread. They have very rarely any change of food; an odd day in a few weeks, that baneful system of a belly full of raw horse flesh, which has no ultimate good effect whatever, and must disorder the stomach by the heavy weight given but seldom, much more than where they are accustomed to it daily, when habit, which exercises such great influence over nature, would enable them to bear it without so much injury; the above food, with this odd day of flesh, and now and then a drench of whey, is their general food from the time they leave off giving them milk, till the time they are wanted to course; and in the same way afterwards, with some variation, when in training.

I do not quarrel with, or even object to, the *substance of raw horse flesh,* as proper *occasional* food for dogs; it is to the manner in which that substance is given to them which I object to; only now and then a belly full, as the common term is; although at the same time I am aware that under such circumstances, an evidently visible and perceptible increased firmness in the dog's own flesh next day will be the consequence of such a meal, when he has been previously living on weaker or lighter food;[1] but not so his wind, which will be affected by a consequent partially disordered stomach. If you give a dog, when he has been for some time previously fed on other sorts of food, a pound, for instance, of raw flesh, for a few days, and his meal made up of bread, or pudding and vegetables, it will strengthen, invigorate, encourage, and do him good; and a return to other food afterwards will be a congenial change, and carry on the good effect. But a full meal of raw flesh, and only on one day, in one, two, or three weeks, cannot be attended with ultimate benefit, on one hand, nor can a continued sameness of diet, the rest part of the time, contribute any benefit to that one day's change, or tend to strengthen the dog without it.

Whether the result of Magendie's repeated experiments in feeding dogs is most proof of this system being bad, or the effects from this system, known by almost all coursers, are most proof of the correctness of Magendie's experiments, I will not pretend to determine; but the one confirms the other so closely, and with our own feelings and desire for a change of diet, must place the matter beyond the reach of all cavil or dispute as to its being a fact that a variety of aliment is beneficial, while a want of it is highly prejudicial to the health and strength, and even the life of an animal. But the food herein mentioned as being generally given to greyhounds, where the inmates of the kennel are numerous, though the substances are good of themselves, the most important of them, flesh, is deprived of its most congenial properties, and rendered on the contrary an unnatural food; Magendie proves, that a dog will live longer on flesh than on any other food, confined to only one substance; but even with that alone, for a length of time, he does not *joy* well. This flesh, in kennels that I allude to, is boiled two or three times longer than it ought to be; little except the fibres left of it; a great portion of nutriment evaporated, and the rest in jelly; the richest jelly you can make them will not alone even sustain their life for a length of time; so that the best portion of this sameness or uniform diet is spoiled, and uncongenial to the nature of the dog.[1]

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[1] The nutriment in flesh is of a better quality than that from many other substances, the particles from which eventually penetrate into the fleshy parts of the dog, and give a more substantial or solid substance to the body than some other food does, which causes them to handle more firm.

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[1] While the type was setting for this sheet, I received information from a source on which I can rely with the greatest confidence, of the system of food for the inmates of a charitable institution, which is so strongly confirmatory of the baneful effects arising from a long continued sameness of diet, that I should do wrong to omit briefly stating the facts. Lest, however, the correctness of it may be doubted as being contrary to the annual printed reports issued to the Subscribers, which states beef, mutton, pork, veal, bacon, potatoes, cabbage, carrots, and other vegetables, tea, coffee, &c. &c., I must add, that I can prove such to be contrary to the fact for the last three years. They have beef, potatoes, and bread, for dinner; bread and milk, or milk porridge, for breakfast and supper, and no change from this for the year round, except sometimes yeast dumplings, which is bread, only boiled instead of being baked; neither tea or coffee, or bread and butter, on the mens' side of the building, unless they buy it themselves, which but few of them can do, for want of the needful, and never taste any of the other articles enumerated in the annual reports. Now what is the consequence? It must be remarked, that what they have to eat is of a good quality, and in plenty; nevertheless, many of them become consumptive, especially those who go there young, and before their constitutions are established, are obliged to go home to their friends, and die, some in one month, others in three, six, or possibly twelve months, and the other inmates, generally, are often unwell. Now it must be acknowledged, that in this, as in many other cases, there are other contingencies which contribute to this effect—as for instance, it is in the middle of a large town, and when the atmosphere is heavy, the yard, which is spacious for them to walk and exercise themselves, is very full of smoke; but it is a curious coincidence, that my informant came to me, just as we are printing this sheet, with the idea full on his mind, without knowing any thing whatever of this part of my subject, that their general illness in the institution was more owing to this sameness of diet than any or all other causes, and he gave me the following instance: one of the inmates could not eat his food; an inquiry was made of the

The injury from this second point of kennel management may be much more easily obviated than the first, by adding a good portion of vegetables most days, sometimes of one sort, and at other times another sort; potatoes, turnips, carrots, cabbage, mangel wurzel, or any other; and instead of horse flesh, give sheeps' heads and plucks, cows' livers, asses' flesh, if it could be procured, any offal from butchers' slaughter houses, and a variety of other things, changed and alternated either in regular routine, or, what would be better still, promiscuously, as the different things are most readily to be procured. In short, where they have so many together, they should assimilate their food and management of them as near to that of a dog well done to as they can, where only one is kept at one house.

The third and last point of this system of kennel management, or rather of kennel mismanagement, is in giving very much uncongenial or unnatural food, on the one hand, and omitting to give that which is the most congenial of all others, on the other; in some kennels which I know, where the aid of friends is in request to furnish the required number of *good dogs* to take to a coursing meeting, though the inmates of their own kennel left behind are numerous, they not only give their puppies the nutriment from the flesh in the broth, but when in training for the course they

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manager by the Committee of Governors for the cause, and was answered that he was a dissatisfied man; eventually, as a punishment, he was ordered to be kept on bread and water for a week, which was accordingly done. His stomach still loathed his former food, and he was kept another week on bread and water, when he became so ill that he was obliged to be sent home, where he died in a few weeks. Now at home he would have a change of food, that is, if he could eat any; but what does Magendie prove? Why, that a dog fed on good bread and water alone will die in fifty days; feed him on it for forty days, and then give him a change of food, he eats it voraciously for a day or two, but will die at the end of fifty days the same as if he had no change of food, and when opened presents all the well known marks of final decay—and what is the obvious inference? Why, that the vital parts are irrecoverably injured for want of an earlier change of diet. I know many workhouses for parish paupers where they change the diet frequently, and the inmates are generally healthy.

add cowheel and cowheel broth; bread made up with broth from sheeps' heads and plucks, instead of water, and upwards of one hundred eggs to two stones of flour, too rich and nutritious by one half; but the nutriment is not of a proper quality, or congenial to the nature of the animal's stomach, the opposite extreme to feeding wholly of raw horse flesh, but leaving much more pernicious effects behind it, satiating or almost sickening the dog with richness of food, injuring the faculties of his stomach by not having their natural functions regularly to perform. The stomach may be said to be deprived of its regular and natural course of exercise; and why should not the muscles of the stomach, and other organs of digestion, relax into weakness for want of exercise, the same as the muscles of the outward body relaxing, the flesh becoming soft instead of hard, firm, and possessed of powerful capability? The same applies to eggs, if a dog were attempted to be fed wholly upon them; yet a few of them are a useful, and indeed a most excellent auxiliary, probably the best of all others.

The stomach being nauseated, weakened and debilitated, disorders all other parts of the organization, impairs the constitution of the whole frame, and disinclines the palate for the more ordinary, plain, substantial, and at the same time, more congenial food;[1] and all under the erroneous idea of giving *much nutriment in a small weight and compass*, as being better for fine wind; thus *forcing* the strong healthy dog in an unnatural manner with food more suitable for a weak, sick, or delicate feeding one, whose stomach requires his food preparing for him. Others give isinglass jelly, aniseed, sugar candy, spanish juice, oil, ale, and other things, forming altogether a heterogeneous compound of absurdity and nonsense.

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[1] Accustoming greyhounds to so much delicate and dainty food, reminds me of a noble Duke who sojourned at an inn nearly a week; carriage and saddle horses nearly twenty, and of course a numerous retinue of servants, who had a room to themselves. They requested as a favour of the innkeeper, from whose own lips I heard the account, that he would provide them any thing he chose for dinner, except "roast or boiled beef, roast or boiled mutton, or plumb pudding." The inference is obvious. They had been accustomed so much to many dainty dishes, with at all times a good supply of the more substantial old English fare of all three sorts, that the latter had become loathsome to their palates; whereas, had the dainty dishes been less often furnished, and the more substantial ones more alternated on different days, their satiety would not have risen to so great a height.

On the other hand, not to mention other food more congenial than the above, they overlook that little article, bone, the most congenial of all food for the dog, of which the old huntsman on his death-bed recommended to his son to give them plenty, a moderate portion of which would, in some measure, neutralize the bad effects from so much unnatural food; giving so very much of unnatural, and omitting altogether the most natural food, is like cutting the dog's constitution with a two-edged sword. Where the inmates of a kennel are very numerous, they rarely taste any bone, are seldom treated with their favourite dessert; while where only one or very few dogs are at a house, they get a moderate portion most days. This of itself, in my humble opinion, makes a great difference to a dog, and especially to a growing puppy.

Any one of these three systems of mismanagement, without the others, would injure the dog's constitution, though it might not be perceptible in one generation or two; but all three systems combined, and directed to one effect, renders the result so conspicuous, that it is perceived in the first generation where there had been no known defect in their progenitors. Without searching for other reasons for the obvious difference between only a few dogs reared at a house, and a great many, these three reasons are all sufficient, the course of each stream drawn together, and directed into one channel, the channel of deterioration.

But they breed from dogs and bitches whose constitutions are thus impaired; and finding the breed degenerate, they must have a fresh stallion; an entire change of blood; but they soon find themselves no forwarder. I had an opportunity very recently of witnessing, what I may term, a *double proof* of these effects; five brace of greyhounds were sent off to an annual coursing meeting, just one half of which were from friends' houses, of the same breed, and I believe about ten brace of running greyhounds left behind, like idle vagabonds, in their old quarters—their own kennels; within a few days of which, three or four brace of puppies, about twelve months old, of two or three different litters, but all by one dog, were brought home from quarters; they had many brothers and sisters of the same litters at home where they had been reared together; but in size, in looks, in muscular and bony structure, in grandeur, and the furnishing of every part, they were no more like the fresh comers "than I to Hercules." Now these were all out of bitches of first-rate blood, and all by one dog, nowise consanguineous to them, but quite a change of blood, and these were the first generation of that cross.

The owner brought one of these fresh-come puppies to me, as thinking it as fine a puppy as ever he saw, so well furnished at all points, powerful and fine; and so he was; but said I, "he would not have been so, had you reared him at home." "Why not?" says he; "because," returned I, "there is so much difference between rearing one, or very few, at a house, and rearing a great number together." "Yes, we all know that; you have no occasion to tell me that," says he; "but how do you account for it?" I then mentioned the simple article of bone, and explained its properties, effects, &c., which considerations appeared not to have occurred to him before; and without going into the other matters, I left him to *chew the cud*, thinking it would be quite enough at one time for him thoroughly to *digest the bone*, without loading his *stomach* with the other food connected with the subject.[1]

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[1] This was no other than that celebrated courser, Mr. Hassall, whose success the first five or six years of his public career as a courser, and while the inmates of his kennel were less numerous than afterwards, was inferior to no courser's success in the united kingdom. But after increasing the number of his greyhounds, and breeding for sale as well as for coursing, has kept getting worse and worse, not having won a cup for five or six successive years, until one of those reared for him by a friend won him the Derbyshire Puppy Cup, 1833. I am induced here to allude to a remark he made to me on the subject of a mutual friend of ours, which was, "his making such a fuss, and pretending to know so much about greyhounds, yet only kept three or four brace." On this I must be allowed to say, that for a man who in general carries as much *candle and lantern* about with him as most men do, that remark was not very *enlightening*, nor over and

It is not only necessary for puppies and running greyhounds to have this proper exercise, congenial food and change of diet, but also the stallion greyhounds and brood bitches kept for nothing but breeding; as to have a perfect good greyhound to run, you must first have him *born a good one;* then with proper exercise, all the rest goes in at the mouth of the dog.

Greyhounds fed during their growth with natural and congenial food for their age, will give them more courage than if fed and forced with unnatural food. The latter may give them size and substance, but not of a firm or solid nature; while the former,

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above pungent; for if it can be said to amount to any thing, it must be tantamount to saying, that the man who keeps the greatest number of greyhounds (and he had perhaps thirty brace, old and young, at the time, in his own kennel) that man has the greatest degree of judgment in that animal; but I am of opinion that the inverse ratio will be deemed the soundest criterion of judgment. It did not fall to my lot to see much of his famous dog Harold the last year before he died, but I am informed by a gentleman who often saw him in that year, that he was nothing like so good a dog as he was when first Mr. Hassall had him, and he was not six years old when he died. This was partly owing to his lameness, and consequently not taking so much exercise, for fear of further injury, as he otherwise would have done; yet he would have been deficient in exercise had he not been lame like the rest of the kennel; and the other part of the cause of his falling off was from the continued sameness of food as is before mentioned. Now the greyhounds belonging to this mutual friend alluded to, and his own, never came in contact with each other; or if they had, not being of the same breed, it would prove nothing as to which of them was the best manager of their greyhounds. Unfortunately, however, for *his* argument, I have a case in point, in another mutual friend, Mr. Bates, who keeps but about the same number of greyhounds as the other friend; and what is more, of the same blood as the favourite blood in Mr. Hassall's kennel, the united blood of old Grasper, and his madam and Hippogriff. Now Mr. Bates has only run his dogs at the four last Derbyshire meetings; the first of them he carried away the cup from Mr. Hassall with his dog Burgundy, by Grasper, out of Hecla, daughter of Madam. The next meeting, Burgundy took the aged goblet from him—and mark, I have it from Mr. Hassall's own lips, who saw the last course, that Burgundy ought to have had the cup instead of the goblet; Mr. Bates's Bertha, out of half-sister to Burgundy, being out of Bessy by Grasper, out of Brill by Hippogriff, won the Puppy Cup. The following meeting, Bertha won the aged cup, with plenty of proper exercise, may give them the same size and substance, but of a much firmer texture, and even the bone itself be more solid; thus they grow with their growth, and strengthen with their strength, and become more powerful, more courageous, and more speedy than the others when arrived at maturity. It is not so much the apparent largeness of muscular and bony structure as the firmness and solidity of it, which gives the greatest power and speed.

"No animal," say some authors, the correctness whereof is doubtful, "is found more perfect than most animals in a wild

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and Mr. Harris's Harkaway, bred and reared by Mr. Bates, won the goblet, two sisters of one litter running first and second for the prize. Burgundy divided the Vernon Stakes, after beating Mr. Hassall's favourite bitch, Hecubina. Burgundy won the Morfe Cup the same season, and will run again for it this season, but it will be too late to insert the result here. Bertha won two cups and a goblet before she was twenty months old. Burgundy has started twenty-seven times in public, and won twenty-two of them, winning two cups, one goblet, and three stakes. Bertha has won three cups and one goblet. Barbara, afterwards Harkaway, own sister to Bertha, has won one goblet, a hogshead of port, and three stakes. Bronze, out of Bessy, by Mr. Devonport's Defiance, won the Patshull stakes last November. The last Derbyshire meeting, Burgundy carried away the Bye Stakes from Mr. Hassall's Harriet Wilson, who ran second for the stakes; but Mr. Hassall's Harrington Hebe, the same that won him the Puppy Cup the meeting before, and had been reared by a friend, in the last course for the Vernon stakes, beat Mr. Bates's Bertha. Now, that this tends to prove that the blood in Mr. Hassall's kennel is very good, I freely admit; and admitting his kennel management to be but so-so, is a still greater proof of the goodness of the blood, Mr. Bates not only beating him, but beating other celebrated coursers also; but the more it proves the blood to be good, the more strongly it proves the system to be bad, by having such a great number of greyhounds reared together, and consequently his argument against his other friend, to use his own favourite term, "is completely floored." Now mark the sequel. I know that he has improved his system within the last year or two, by his greyhound puppies having better exercise; how far he has altered his system of feeding, or whether at all, I know not; but at the last Derbyshire meeting he won the Puppy Cup with Hermione, which, I have reason to believe, he reared himself. I beg his pardon if I have done wrong in making such free use of his name, but he has acknowledged to me that, in this work for the use of the public, state; nor have we any right to presume upon making improvement in them beyond their state when originally created, by any ingenuity of our own, further than a more perfect development of their powers and attributes in succeeding generations, such as is seen in the canine species who have numerous offspring at a birth, some of them being more perfect than others."

It then follows that our care ought to be to prevent the breed from degenerating from its original perfection, to do which, certain essentials are prominent to our senses, as being particularly necessary to be observed. Amongst those essentials, the first is that of rearing those already born to us in the manner most consistent with the dictates of nature, indicated to us by their instinctive propensities, both as to their food to nourish them, and their exercise to develop to perfection their muscular and bony structure.

Having done this, and to proceed to the further generating of the species, the next care not to deteriorate the breed seems to be, the selecting *the best* of former productions to breed from, and not to breed from those having a defect in any attribute, unless there is a redundancy in the same attribute in the mate appointed, nor to aim at a greater or less size than the original perfect ones; as by doing either, though you may gain in one attribute, you lose in another, and destroy that unity of power and symmetry of shape, which alone gives the best possible strength and speed to maintain the longest and most severe struggle, the medium size being found the best.

I ought to explain such facts bearing on the subject which have from time to time come to my knowledge, and he knows that I am making frequent allusions to his kennel, and have reason to hope that these remarks will not offend him. He has, however, as a confirmation that he approves of my doing so, very kindly, and unsolicited by me, volunteered his leave for me to make use of his name, in sending Prospectuses of the work to different amateurs of the Leash, and to say that there are many strong and satisfactory proofs in his kennel of the correctness of my theory, with some parts of which I have occasionally previously made him acquainted.

An imperfection in any point of shape may be improved by a redundancy in the same point in the mate; so may a deficiency in size be improved by one of above the medium stature; or you may obtain some favourite object as an improvement for a particular purpose, by crossing different sorts of animals of the same species, as the thorough blood with the cart horse; the long with the short-horned cow; or different sorts of sheep, as was the case with Mr. Bakewell, in producing that breed called the new Leicestershire; by crossing different sorts of dogs, as the pointer with the setter or spaniel; the greyhound with the bull dog, for the purpose of the midnight poacher, or for producing flashy speed in coursing; but if you gain in one attribute you lose in another, as regards each separate order of species. If you have a good breed of long or short-horned cows; of blood or cart horses; of any particular sort of sheep, or of dogs, which you wish to continue entire and unmixed with any different sort, you must not expect to improve that breed which seems to you to be already good and perfect of its kind. What you have to endeavour to do, is to avoid deterioration of it. Many things which may appear trivial in themselves, will contribute to, or unite, towards that deterioration, so that upon the whole you may get worse the further you proceed. These trivial things require most to be guarded against. In greyhounds where there is one dog produced, and continued producing generation after generation, equal to the original standard of perfection, there are perhaps ten or twenty, from different causes combined, which have suffered deterioration in one essentinl attribute or another. It is a very common error to expect great improvement from a fanciful cross; to keep from getting worse is the most wise expectation, and most meritorious endeavour; the opposite is vain and visionary, and almost sure to be attended with vexation and disappointment. Deterioration occurs in such a variety of shapes, that if you can steer entirely free from it, you will not easily be beat for the cup.

I am not supposing by all this, that no possible improvement may be made in any one breed of animals; they are now, in all probability, deteriorated from the perfection of their original creation, to bring them back to which, let deterioration be avoided, by every stage of the proceeding being performed in the greatest perfection, as the safest, and probably the only way of effecting that restoration of perfection; in order to do which, in breeding greyhounds, you must avoid ignoble blood, or any indication of it. Choose honesty and courage in running, and good constitutional strength and stoutness, in preference to flashy speed which cannot be maintained, and is deemed by many to be merely artificial.

Nature has provided the race horse and the greyhound, both animals of great speed, with a greater fineness of blood than the slower animals of the same species, the cart horse, or the shepherd or bull dog for instance; the blood is of a finer texture, and more of it; the globules in it are smaller, consequently offer less obstruction to its rapid circulation, past the multiplicity of nooks and corners of the veins and arteries, when propelled by galloping, causing less congestion about the lungs to load them, and obstruct their action, by which they have finer wind; their bones are of a finer texture, and more solid; also the fleshy fibre, and sooner compressed by exercise into strong muscular capability. We know that a thorough-bred horse has finer wind than a cart horse, or one half-bred; the latter will come nearer the former in speed in the first part of a mile, than in the last part; so will the cross-bred greyhound, or as some term them the soft breed, cut a better figure with the true or hard breed at the first part of a course than the after part; this is partly owing to a true bred one having finer wind from finer blood, and partly from not suffering bodily exhaustion to bring on violent action of the lungs so soon as the soft-bred one, by his firmness of muscles and nerves, and solidity of bone, with wider nostrils and windpipe, allowing more free respiration, altogether supporting his bodily strength longer than those of the soft-bred one will.

Doctors, however, differ on this subject, as on some others; one says, it is not from any difference in the composition of the blood, but from the constitution; and that he does not believe that a blood horse, in his natural state, that is, taken up fat from grass, has any better wind than a cart horse in the same state. Now I should think, if he would try the experiment, he would find a greater difference between them in that state, than when both were in the best galloping condition he could get them. Another thinks it is more the difference in the nervous system than from any difference in their blood, or that the race horse is provided with a more capacious chest, giving more room for the lungs to act than the cart horse; and the same by greyhounds and other dogs. Another, to whose opinion I pay much respect, says it is the breed altogether; they merely call it the blood for the sake of brevity; he does not believe, if you were to analyze the blood of a race horse, and also that of a heavy cart horse, that you would find any difference in its component parts, or in the size of the globules; neither does he conceive there is any difference in the blood of other animals.

Now I can readily imagine, that the same elements compose the blood of most animals as the blood of the human species is composed of, but not the same proportion of each element. And as the blood of a race horse compared with that of a heavy cart horse would form a good criterion by which to judge of the relative difference in the blood of a greyhound and that of a heavier and coarser dog, as the bull or the shepherd dog, I have searched, but in vain, all the veterinarian works within my reach for an analysis of the blood of either, by which to compare the proportion of each element with that of the human species. I am also told by our chemists that it is a work requiring much time, trouble, and nicety, and attended with great difficulty to analyze it correctly, and in a way to be depended upon. I am, therefore, thrown upon the necessity of considering the subject by analogy, that grand source of reasoning and philosophy, on this most important subject.

Physiologists distinguish the blood into two parts—serum and coagulum or clot; the clot being composed of fibrin and colouring matter (snails have no colouring matter in their blood)—the serum is composed of water, albumen, oil and salts; the fibrine of carbon, oxygen, hydrogen, and azote; the colouring matter of oxide of iron, phosphate of lime, and magnesia, pure lime, and carbonic acid. William Henry, in his Elements of Experimental Chemistry, p. 359, says,—"The blood is subservient to various important uses in the animal economy. It is a source, from which are constantly prepared a variety of other substances, both solid and fluid, that are essential to our well being, and even to our existence. From the blood is derived the solid matter of the bones themselves; it does not however exist in the blood in a state of sub-phosphate of lime or bone earth; but appears to be produced from the *ultimate* elements of blood, on the very spot where its presence is required. The muscles which are affixed to the bones, and which, acting as levers, enable us to change our situation at pleasure, are referable to the same source; and so also is all the variety of animal fluids, which perform a necessary part in the economy of this complicated machine." Animals are deemed of warm blood; fishes of cold blood; the former being a temperature of from 95 to 105° of heat whether in an atmosphere at the freezing point, or in the torrid zone; the temperature of the blood in fishes being about the same as the element in which they live.

Magendie says, p. 399, " In proportion as the analyses of the blood are multiplied, and the processes of investigation perfected, we come to discover in the blood all the principles, all the elements of the organs. We can with confidence point out its fibrin as the same matter with that of the muscular fibre; the albumen, that which forms so great a number of membranes and tissues; the fatty matter which combined ozmazone and albumen, *constitutes the nervous mass;* the phosphate of lime and magnesia, which constitutes a great portion of the bones; urea, one of the most remarkable excrementitious substances, the yellow matter of the bile and urine, that which, by imbibition, extends itself in the cellular tissues, around contusions," &c.

He states, what appears to me a very important fact in the consideration of this question: " Prevost and Dumas examined the blood of twenty sound persons, and a much greater number of sick, and have not been able to observe any difference from the age, sex, or morbid state of the persons." This is in allusion to the elements of which it is composed, and to the size of the globules. The *state* of the blood is nevertheless subject to very material alterations, by sickness, climate, and a variety of other causes; nor need we wonder at its elements remaining the same in all persons, being originally of one creation, and descended from

Adam and Eve; many reasons are assigned as demonstrative proofs that blood is endowed with life; life is defined to be "the contact of arterial blood with the organs, particularly with the brain. There is no doubt that a certain composition of the blood is one of the most important conditions to a due exercise of the different functions."

It would therefore appear, that in the human species what difference is observable in their powers and actions, that difference, by many, is ascribed to the blood being better in one than in another, is not so in fact; it is more properly the constitutional habit both in mental and bodily capabilities, not only in themselves but in their progenitors, and probably for many generations preceding them; it is an additional proof, if any were needed, of the necessity for the parents' muscular and bony structure being perfectly developed by exercise and exertion, to produce offspring in perfection in those attributes. Infants born from parents of rank and talents are sometimes, by accident or otherwise, thrown into the hands of low and illiterate people, and are brought up with their own children in every respect of education and other treatment; yet they are frequently observed to have some different tact or peculiarities different from those children, which is commonly ascribed, when the child is eventually discovered to be of higher birth, to a difference in the blood of its parents to those with whom it is brought up; if it shows different and better manners, better deportment, greater facility in learning, which has sometimes been seen in them, the probability is, that its parents, and for some generations, had their intellects better cultivated, and their minds expanded by better education; this improvement of their faculties is conveyed to their offspring, who from his innately possessing better faculties than his associates, knows better how to understand circumstances around him, and conducts himself differently upon them to what his associates do. The same by bodily powers, by courage, some having stronger nerves than others; these faculties are all derived from the blood composed of the same elements, but differently developed by exercise, which, in a succession of generations, that difference becomes very great. These acquirements may all be lost again in a few succeeding generations for the want of those several faculties being duly exercised.

The difference in temper and disposition amongst mankind is an acquirement of the same kind; those faculties, fostered and strengthened by indulgences or exercise of them, though first contracted possibly by accident or education, may for some generations become, as is often termed, hereditary in the offspring, though, at the same time, such difference in these faculties are not inherent in the blood. This intellectual capacity may, and I have no doubt is in some measure, expanded in the greyhound so as to affect the offspring; we see some who have every appearance of good breed about them that are more crafty than others; in some cases it may be only from their own education, by being coursed too much when young, and not being arrived at their full measure of strength; in others, it is owing probably to their sire or dam, and to generations before, having been educated in that way, and strengthens that propensity in the puppies. I know as fine a looking well bred bitch as any I *do* know, that was reared where hares were plentiful, and from six months old to the time she was taken away from quarters, coursed them very often; her puppies are crafty; but this must be observed, by this custom of running frequently, she soon became crafty, did not distress herself very much, and by that frequent exercise strengthened her muscular and bony structure, and laid in such a stock of constitutional strength that she ran a good bitch till twelve or thirteen years old; not a true honest runner, but so stout that it was a good hare that could get away from her single handed at that age.

But even with this intellectual constitution the true bred ones are not so crafty as the cross-bred, flashy speeded sort; nor is their craftiness visible so soon. In the true bred sort, this craftiness may be got rid of in two or three generations by proper management of the puppies, and not running them too much and too soon; in the other sort, you cannot get rid of it, nor wash the propensity entirely out of the blood by many generations of crossing them with the true breed, nor by any system of management.

With respect to intellectual capacity, there is an old and very common saying, "that the oldest brothers are always the greatest fools." This is not without some truth; neither is it without reason that it should be so. But it applies more to those whose parents marry young, say at twenty years of age, or little more, than when they are of greater age, and of more considerate habits, before they marry. I am myself an elder brother, and have, in my youth, been taunted with that remark, and probably at that time did not think there was any truth in it; but I think differently now; laugh at my candour, ye elder brothers, who like to do so; truth, and fair exposition of facts, is my object. I am satisfied that my younger brothers possessed better abilities than my own; nor do I stand alone in that way; when I look around me and reflect on the acquaintances of my whole life, I am satisfied that the greater portion of elder brothers were inferior, and are now, in capacity to the younger ones in very many families; however good their natural abilities, and however those abilities were fostered and cultivated by education, the oldest son stands most chance of being a *spoiled child*, has less considerateness and more volatility than the younger ones, and is a longer time in *sowing his wild oats*, and settling sedately to study and serious thought, and consequently his mind and intellectual faculties are less expanded at a certain age, although he may afterwards become a man of genius and good knowledge; if he marry young, and before his faculties are properly strengthened by exercise or laborious study, it will affect his offspring; it must, it cannot fail, to affect the faculties of their offspring, according to the age and state of the faculties of the parents at the time such offspring is begotten; and so on from generation to generation.

The strength of the nerves and of all the other bodily powers, the courage and every faculty, are affected in like manner in all animals; the greyhound is better or worse, according as his progenitors, as well as himself in growing to mature age, is better or worse fed and exercised; so is the bull or shepherd dog, and all other dogs in their kind; so is the blood horse, the half bred horse, or the heavy cart horse; they are each and all subject to this difference, according to the treatment of themselves and their progenitors as to food, exercise, and the healthy or unhealthy state of the parents at the time the offspring is generated. It is the same with gout in the human species, though affected in the opposite manner to being strengthened; in some, it is supposed to be hereditary, which at the same time is merely constitutional from one or a few previous generations; the parts are weakened by inflammation and pain, and the successors pre-disposed to receive the inflammation.

But this does not prove that the blood of the heavy cart horse is composed of the same elements, and the same proportion of each, as the blood of the race horse; it goes far towards proving the contrary to be the case, as respects the proportion of each element; we have every reason and every right to consider them as of a separate creation, male and female according to their kind, and the same by many of the canine species; but can you breed from heavy cart horses with heavy cart mares, and by any system of management, change of climate, or other means within the ingenuity of man, so as to bring them to be like the thorough-bred horse? Can you breed from male and female *both* of that part of the canine species destined to pursue their game by scent, with large head, wide blunt nose to meet a great volume of odoriferous particles in the air, or on the ground, and capacious nostrils, to convey them to the upper regions of the nasal cavities, where the principal seat of smell is situated in the olfactory nerves, and by any system of management whatever bring him to be like the greyhound, to pursue his game by sight, and at great speed, with a long head and fine pointed nose as if to split the air, and allow the odoriferous particles, with which he has nothing to do, to pass by him with the idle wind? Can you, by keeping the breed entire, give the terrier, the bull dog, and others of thin coat, the fine silky soft close coat of the spaniel, so necessary to keep him warm in his peculiar element, the water? Or give the common barn door or other fowl kept on land, the fine close downy feather of the duck, and other water fowl? Can you manage an entire breed of almost any sort of dog, save the bull dog, so that he shall, generation after generation, have the propensity to seize the bull by the nose, the most tender and efficacious part to hold him by, and when he bites the bull or any other thing, *to keep his hold*, without biting fresh places, and worrying? These propensities, cloathing, &c., are inherent in the composition of the blood. You must do these and a hundred other impossibilities before you can prove that the difference between the blood and the cart horse is only constitutional, or otherwise than the constitution of the blood itself, or that the blood in each is constituted of the same elements in the same proportion of each element; when it is proved by a perfect analysis of the blood of each, and the size of the globules being alike, I can believe it, but not until that is done. We find from Magendie's experiments that "we discover in the blood all the principles, all the elements of the organs; there is no doubt that a certain composition of the blood is one of the most important conditions to a due exercise of the different functions; that of the blood is the source from which all the organs are derived—the nerves, the muscles, the bones, &c.; the bones are principally derived from the phosphate of lime, and pure lime in the blood:" if the blood of a race and of a cart horse were of the same proportion in each element, and of lime in particular, the bone itself would be of like quality; but it is well known, by an equal admeasurement of the bone of each, that the bone of the blood horse is much heavier than that of the cart horse, is much more solid, and in appearance altogether different, as much so as between oak and deal in wood.

The probability is, that in different species of animals, according to their adaptation for their several destined purposes, there may be a variety of different proportions in each element of the blood; a greater or less proportion of serum to clot; of fibrin to colouring matter; of water to albumen, and of the latter to oil and salts in the serum; of carbon to oxygen, of hydrogen to azote in the fibrin; of iron to lime, of phosphate of lime to carbonic acid in the colouring matter. All these would ring the changes to a great extent, and may cause all the different varieties observable in different animals.

Mr. Blaine says, "the fluid of the blood is serum; it forms about four-sevenths of the whole; the proportion being somewhat smaller in the horse than in the human." Magendie says, "The respective relations in quantity of the serum to the coagulum, and those of the colouring matter to the fibrin, have not yet been examined with all the care necessary. It is to be presumed, that they are variable, according to an infinity of circumstances."[1]

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[1] This is very probable, and may account for the alteration of appearance in dogs and other animals by a change of climate; the Oriental greyhounds are very different in appearance to the European; the latter taken to the former country, in a few years change their appearance, and breeding from them in that country only a few generations, alters their appearance very

We have so far a fair presumption from good authorities, that the composition of the blood varies in different animals in one element or another; but as the size of the globules differing in one animal to another, and their offering obstruction to the circulation of the blood, as affecting the wind, is the most important point in dispute, as relates to the race horse and the cart horse, or to the greyhound of true blood, compared with one crossed with ignoble blood, I will here add some remarks of Magendie and others upon those globules; they stand upon more positive evidence than the foregoing disputed question relative to the blood, and tend to confirm the view I have taken on that subject, that if the globules vary in size in different animals, we may fairly presume that the blood varies in other respects.

Magendie says,—"When by the aid of a strong lens or microscope we observe the transparent parts of cold blooded animals, there is seen in the blood vessels an innumerable multitude of small round molecules which float in the serum, and roll, one upon another, along their course through the veins. These are the globules of the blood. The unlooked-for discovery of these particles must be referred to Malpighi. Leewenhoeck dedicated

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much. By a change of climate, they become finer or coarser in their bodies; their coats are coarser or finer, longer or shorter; but I have yet to learn that it will change a fine silky coat to a woolly one, or the latter to a wiry haired one. An European man, with white skin and hair on his head, sent to a hot climate, will darken his complexion, but it will not make a black-a-moor of him, with wool on his head instead of hair. I will not go into the disputed point as to whether the black man is of a different creation to the white one; nor does it appear material to my subject whether in the original creation of men or animals, the body and the blood were simultaneously formed, or whether either preceded the other; but it is evident that both are formed of the same matter, and correspond with each other; and as the seed is from the blood and the organs in each generation, the offspring takes the shape and appearance of the parents, one offspring resembling the father, while others resemble the mother, which may arise from a variety of causes, and particularly as to one being in a better state of health than the other at the time the offspring was generated; thus one offspring will take after one ancestor, and another offspring from the same parents take after another ancestor.

his attention to them soon after; since that time a multitude of authors have undertaken their examination. Amongst them, Hewson, Dumas, and Prevost; who all agree in the main facts. They have found globules in the blood of all animals. To ascertain this, it suffices to put a little drop of blood upon a plate of glass, taking care to spread it gently without crushing. Upon the edges are always found insulated globules, easy to be observed and measured. The blood globules move with such a velocity, that when an experiment commences, the observer suffers at first a species of vertigo; but immediately the circulation becomes slower, the capillary vessels present merely a tranquil current, and the globules seem to drag themselves with effort in the fluid which floats them along; they creep into the little vascular ramifications, lengthen themselves if the space be too narrow for them, and remain *often caught in those strainers* to the moment when the successive efforts of those which follow them are enabled to make them free the obstacle. Sometimes they happen to meet with a *sudden shock* from the obstacle presented by the *narrow space which separates the two vessels;* one would then think for a moment they beheld a floating, very flexible bladder, which drove, by its centre of gravity, against whatever obstacle was opposed to its course. Like it, the globule stops and moulds itself upon the body which obstructs its passage; the current of fluid continues to propel it in the same direction, but it *oscillates during a long time,* uncertain whether it shall pass into the vessel opening on its right, or into that upon its left. They are of a *different diameter* in *different animals.*"

It does not, however, appear, that the diameter of the globule is in any way proportionate to the size of the animal; it is circular, and of a flattened form. In fowls, the globules are generally oblong. Prevost and Dumas have formed a table of dimensions by which they appear to have measured the diameters of the globules with great nicety, of which I need not give full particulars of all animals in the five figures of decimals, parts of a French millimetre, and that as many figures of decimal parts of an English inch. The man, dog, and rabbit, are classed together, and are about as 2 to 1.85 of the ass. The ass as 1.85 to 1.5 of the horse, and 1.37 of the deer and chamois, which is quite sufficient to show that there is a material difference in the size of the globules of different animals without that difference being any way dependent on the size and bulk of the animals themselves.

It must, therefore, be obvious, that such a multitude of globules which are seen obstructed in their passage through those narrow spaces, of which there is also a multiplicity, must tend to impede the circulation of the blood in any animal, and that where the globules are larger in one animal than in another, the circulation of his blood when propelled by gallopping must be more impeded than in the other, and consequently cause more congestion about the lungs, by which they are more loaded, and cannot act so freely.

That there is this difference of size in the globules between the blood and the cart horse, may, among other reasons, be fairly presumed by the extra quantity of blood found in the blood horse, with a corresponding greater number of vessels to convey it, than in the cart horse (which of itself tends to prove them not of the same creation) and at the same time they are well known to have finer wind. There are other auxiliaries to fine wind in them, it is true, in their different organization throughout; but all that is evidently derived from the composition of the blood, and one is auxiliary to the other. The blood horse has wider nostrils than the cart horse, a longer neck, and both longer and wider windwipe, giving power of inspiring and respiring a greater volume of air.[1] These cannot be altered by climate, or any system of management; as to having a greater capacity of chest, allowing more room for the lungs to act, it may be naturally so from the constitution of the blood, or may not; but the capacity of the chest is subject to be greater or smaller in all animals, according to the exercise they have when young and growing; if they have plenty of liberty when young, and take their own playful gallops, they expand their chests very much by it; but if confined, and prevented taking those playful gallops, their chests are much more narrow and contracted; and this is the same with both descriptions of horses, and of all animals, even of the human species.

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[1] This at first sight may appear inconsistent with the comparison of the greyhounds fine long narrow nose to the hound which pursues his game by scent, having a wide nose and capacious nostrils; as the greyhound is an animal of great speed, requiring good wind, consequently requiring a large vent for the passage of the air in respiration; but a greyhound runs with his mouth open, through which he principally respires when at great speed.

Independent of the peculiar adaptation in the formation of the body for particular destined purposes, it appears that the finer and better the blood, the more substantial is the matter composing the body; the body, and each organ of it, is less incumbered with any superabundance of useless and ineffective substance; if you look at the nostrils of a cart horse, the skin at the edge is thick and heavy; the part which protrudes inwardly almost meets the opposite side of the nostril; while in a blood horse that protrusion is not so large, nor does the skin look near so thick and heavy.

The blood is the most essential part of the animal composition; many matters, however, concerning it, are yet unknown or undefined; Magendie adduces numerous proofs of how much we have yet to learn on many matters relating to physiology, which he considers to be *yet in its cradle.* It is yet probable, that the better the quality, and the greater the quantity of the blood, the better the animal's strength will be supported during severe and long protracted exertion, the several organs of the body being thereby of a finer texture and firmer quality. As the blood is essential to the body, so is the oxygen of the atmosphere essential to the blood; the latter, after leaving the lungs, loses a portion of its colour in going its rounds of circulation, which seems to be distributed over the different parts of the body for some purpose, not

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The capaciousness of the nostrils, windpipe, &c., may vary some little either in the blood horse or the cart horse, or in different sorts of dogs, according as they or their progenitors have had those organs enlarged by exercise, and thus be constitutional with them; but this variation in those parts of the same breed is by no means so great as the difference in those parts between the thorough blood and the heavy cart horse.

yet clearly defined, in support of the animal economy, which colour is restored to it again on its return to the lungs by its contact with oxygen inspired with the atmospheric air; the blood there takes a vermillion colour; it then follows as a natural consequence, that as the race horse has a greater quantity of blood than the cart horse, he requires a greater quantity of oxygen to be conveyed to the lungs as an essential attribute of the blood, and which we may rationally conclude gives additional strength to the body; hence the necessity for more capacious nostrils and windpipe to admit a greater volume of atmospheric air to the lungs, which serve also for a more free respiration.[1] By this we see the admirable adaptation of every organ and attribute in beautiful unison with each other, of this complicated and intricate living machine by the divine Creator, the great Architect, far superior to any thing human ingenuity can invent.

We have no rational ground for supposing that any difference exists in the nerves of men, or between any two animals of the same kind as one creation, further than what arises from the difference of exercise, exertion, or the other variety of causes which influences the muscles and other organs; yet we find great difference in the nerves of different men, and they are a very important organ in the system, from which are derived greater strength, hardihood, courage, &c. They, in their turn, derive their support from the blood, and consequently in animals, differing in their blood and nature from each other, the nerves are stronger or weaker.

Magendie says, p. 429,—" It is a general law of the economy, that no organ continues to act without receiving arterial blood;

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[1] Magendie says,—" The chemical composition of the expired air from the lungs is different from the inspired air; the proportion of azote is much the same, but that of oxygen and carbonic acid is quite different; even oxygen, when pure, is destructive of life; and its mixture with azote in different proportions from that of the air, always kills the animals that breathe it, sooner or later." This applies very strongly to cleanliness of kennel management, and will be found more fully explained under that head.

from this it results, that all the other functions are dependant on the circulation; but the circulation, in its turn, cannot continue without the respiration by which the arterial blood is formed, and without the action of the nervous system, which has a great influence upon the rapidity of the current of blood, and upon its distribution in the organs. Indeed, under the action of the nervous system, the motions of the heart, and consequently the general quickness of the course of the blood, are quickened or retarded."

"The composition of the blood must exercise a great influence upon the *mode of action* of the organs, but we have still but very imperfect notions respecting the chemical variations which that fluid may undergo. There is no doubt that a certain composition of the blood is one of the most important conditions to a due exercise of the different functions."

It is rather singular that Buffon, in his theory of the growth and re-production of animals, says very little of the blood; he does not expressly state that the blood is a component part of each and all the living organic particles derived or extracted from the several parts of the body, the surplus of which is thrown into the seminal reservoirs for the purposes of procreation and re-production; yet it follows, as a necessary consequence, that the blood is a component part of each of those organic particles, and the blood appertaining to that part of the body from which each particle is derived; the particles from the head, for example, take their seat in, and form that part which constitutes the head of the fœtus; those from the neck, the arms, the legs, or the trunk, form those several parts of the fœtus; the same by the particles derived from the skin, the muscle, nerve, tendon, or bone, though distinct from each other, form those several substances in the several parts of the fœtus, corresponding with the parts of the body from which they were derived; the portion of blood forming a component part of each particle, may, from what is before given under the physiological authorities mentioned, be deemed the agency in animating those particles for the purpose of re-production, forming a component part of them, and conveying them to the seminal reservoirs, and may regain the agency in the conjunction of the sexes. It therefore follows as a necessary consequence, that in the blood of the living animal, are "all the principles, all the elements, of the organs," which Magendie states to be found to be the case "in proportion as the analysis of it is multiplied, and the process of investigation perfected;" the fibrin of the blood composed of the same matter with that of the muscular fibre; the albumen, that which forms so great a number of membranes and tissues; the fatty matter which combines ozmazone and albumen, constitutes the nervous mass; the phosphate of lime and magnesia, which constitute a great portion of the bones, &c.; therefore, according to both these high authorities, as the blood is, so is the body; and as the body is found to be so, must we infer the blood to be.

Therefore it naturally follows that in the new-born infant the whole volume of blood concentrates that portion of the blood which belongs to each of the several parts of the body. This accounts for the difference observable between the offspring of parents who have a natural, a born, or constitutional defect in some parts of their body, and the offspring from those parents who have only that defect by accidental injury; the offspring of the former showing that defect, and often in an increased degree to the parent; the offspring of the latter showing no defect whatever in that part. Were it not so, the children of a soldier or sailor who had lost a leg or an arm in battle, would be born defective of a leg or an arm; but the blood containing the whole entire elementary parts of the body supplies any deficiency to the offspring which by accident might be defective in the parent.

The dictates of nature are our safest guide, did our judgments but point out the way of following them to the best advantage. A number of greyhounds being at large, and at liberty to run about, if a female go to heat, the males, according to nature, contend for the prize, gather to her, when some warfare ensues, and possibly some one more favoured by the female than the others, is yielded to in exclusion of the rest; but if no favour be shown, the master dog secures her to himself, for that time at least. During this courtship, consummation, and consequent hanging together, some time elapses; the servant or master is apprised of it, and the female is secured. It is not unreasonable to suppose that the master dog, though he may not appear to the eye the largest and strongest, has yet the *firmest* and most powerful bodily frame, and his full share of courage to overpower or overawe his antagonists, the natural inference from which is, that the produce would be better than had the selection of sire from among the same dogs been made by the owner himself, as the firmest bodily frame will of course produce the most powerful progeny.[1]

In rutting time, amongst deer in a park, the males contend for the mastery, and when obtained, which is by firmness of muscular and bodily strength and courage, they are allowed by the females *their supremacy;* so, in some measure, it is with hares, though the contest is not so conspicuous; yet after the time of copulation the females, if coursed, are generally found strong, while some of the males are found exceedingly weak, and others not so; which shows that some jack hares have many jills to serve, which weakens them very much, while others have very few; in addition to which, the female, after the heat is satisfied, has no further attraction of the organic particles to the seminal reservoirs, and consequently those particles are directed to, and employed in supporting the organs of the body for exertion, In the male, those organic particles are continued to be directed to the seminal reservoirs, and the more he is used for the purpose of procreation, the greater is the attraction of those particles to the seminal reservoirs; more of them are extracted from the organs, consequently fewer remain to support them under exertion. This applies equally to greyhound dogs and bitches after copulation, and it is well known that a bitch, for a few weeks after being warded, and her heat gone off, runs as well as at any time. It is an acknowledged axiom, that hares left to nature's guide, and unaided by the art of man to select their own food and mates for procreation, continue to beat the greyhounds at the present day equally as much as in olden times;[2] so is it possible and not altogether improbable, that by the dispensation of Providence we are not permitted to increase the speed of the animal intended for the purpose of thus pursuing the hare beyond its original creation, otherwise they might destroy the whole race of the animals they are destined to pursue. Although this is mere speculative conjecture, yet we do know that if we do not breed greyhounds from the best of litters, that the breed will degenerate; we also know, that where there is one thorough good dog to breed from, there are very many good bitches, which may also be a dispensation of Providence, as one dog will serve many bitches, while one bitch need only be served by one dog. Hares, it is true, are not always bred from the strongest male or female, yet that is no contradiction to the breed of them continuing to beat the dogs as formerly, and their doing so being chiefly owing to their being produced from the master males; as where it happens not to be so, the inferiority of breed naturally arising in the produce, is, on coursing grounds at least, not likely to be continued to go on to a general degeneracy of the breed, as the weakest and worst hares soonest fall victims to their pursuers, while the strongest and best are enabled to save their lives, and to continue the breed in its greatest perfection and strength. This points out to us the utility of selecting none but the *very best dogs* to breed from.[1]

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[1] Since writing the above, a friend of mine lost two of his best dogs by their contention to gain the favour of a fair maiden. They fought to such a degree that they both died soon afterwards from their wounds.

[2] It is held by persons possessed of anatomical knowledge, and the physical powers of the animal system, that in the union of the seed, the combination is stronger on the part of the sire than of the dam; and if so,

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it certainly is essential, on general principles, that the sire should be possessed of great powers and good blood, to keep the breed from degenerating. Experience confirms this hypothesis; the breeders of horses, for instance, seldom put a cart stallion to a full blood mare to breed cocktails, because they generally find that a blood horse put to a cart mare produces the best and most useful stock, while those produced from the contrary cross are very inferior.

[1] Arrian says, p. 151,—"The greyhound bitch is fleeter than the dog, but the dog has more bottom than the bitch; and because he can run through the whole year, is a much more valuable acquisition; and as good bitches abound, but it is no easy thing to meet with a thorough good dog, the latter is on this account more specious. And again, it is fortunate if the bitches preserve their speed to the fifth year, whereas dogs retain theirs even to the tenth; for all which reasons, in my opinion, a really good, high bred dog, is a great treasure—one that falls not to the lot of a courser without the favour of some god. For such a blessing he should sacrifice to

Experience also shows, and the Coursers' Manual confirms it, that where there is a very superior dog, such as Major Topham's Snowball for instance, or Mr. Hassall's Bergami, and Hercules, and some others belonging to different gentlemen, their produce occupy a conspicuous situation in the list and number of prizes won by them and their descendants, in comparison with those won by the descendants of dogs not above mediocrity in their own powers and performances.

Mr. Langdon's Grasper was an excellent runner, and won many stakes, but was only in a medium way in point of size and strength. Many of his early productions were small, but others, as he grew older, *where the cross suited*, were of a very superior order, and are to this day running winners of different prizes. His son, Mr. Hassall's Harold, was an amazing, powerful, and fine dog, and has won a prize at every meeting he has run. His produce have not, however, run successfully; this paradox, or falling off, is not the dog's fault; it is owing to the mismanagement of his owner. He had all his best bitches put to him; but it

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Diana Venatrix. Markham says,—"It is an old received opinion amongst many men of the Leashe, that the greyhound bitche will ever beate the greyhounde dogge, by reason of her more nimblenesse, quicknesse, and agillity, and it is sometimes seene that a perfect good bitche indeed hath much advantage over an ordinary dogge: but if the good dogge meet with the good bitche, there is then no comparison, but the dogge will be her master, inasmuch as he exceedeth her both in lengthe and strengthe, the two main helpes in coursing; for her nimblenesse is then no helpe, sith a good dogge in the turne will lose as little ground as any bitche whatever." I cannot help here differing from my friend Gervase, as I think he is going rather too far, when he says that "the nimblenesse of the bitche is no helpe, and that the dogge will lose as little ground in the turn as any bitche whatever;" for independent of experience, if you go upon the reason of the dog beating the bitch by having more length and strength, he must of course go with greater velocity, and consequently overshoot the ground more than the bitch; besides, if the dog make a longer stride, the bitch's nimbleness will enable her to strike quicker, and thus come nearly to the same point of speed; we sometimes see, although but seldom it is true, that a bitch will beat a dog of an acknowledged superior cast, in both shape, speed, and breed, and that she will beat such dog in speed in the first run up to the hare.

must be observed, that those bitches had, year after year, been fed principally upon a sameness of diet, and that principally of an unnatural sort—horse flesh jelly, and very rarely any bone, consequently their constitutions impaired. The puppies, after a few months of plenty of good milk, kept on the same unnatural food, without bone, and without a sufficiency of exercise, consequently, though many of them were fine looking puppies, they were not firm and solid in their frame. Very few of other people's bitches were allowed to be sent to him; and those restricted not to be parted with to any one who was likely to bring them into a public coursing field to run against the owner of their sire; so that very few of his produce have come into the public lists with *any chance* of ultimate success.

It must be remarked, however, that his bitch puppies have been more successful than his dog puppies; many of them are exceedingly handsome, some of which have won cups and sweepstakes; but I do not know of one dog who has proved himself a real good one, though many are fine, powerful, likely-looking dogs. It would therefore appear, that any defect in rearing is more prejudicial to dogs than to bitches; the powers of the latter requiring less support and exercise than those of the former; this difference of the sexes is observable in most animals as well as in the human species, and may be one reason why we have so many good greyhound bitches for one really good dog. The only son of Harold that I have heard of, who was highly thought of where he ran, was one who had the misfortune to break a leg when about arrived at full age, and he ran a tolerable good one afterwards; but this must be observed, and it is well worthy of attention, he was reared by the same person who reared Harold himself, old Grasper before him, and two very superior dogs in succession before Grasper. There needs no clearer proof of Harold's stocks' want of success being owing to a defect in rearing. Grasper, from his own excellence, and that of some of his progeny, was bought by the Morfe Club, at a good price, and no bitch allowed to be sent to him but those belonging to members of that club.

Now the before mentioned dogs, good in all their shapes, were particularly so midway of their bodies, without which, though they may have good speed for a short distance, are very rarely, if ever, found stout, and maintain any superiority to the end of a long distressing course; whereas, on the contrary, a dog with a good loin, and particularly at that point which may be termed the junction of the loin with the back and last ribs—well ribbed for a good space towards the loin, and the ribs well curved outwards, which add much to the support of the back, is generally found not only very speedy, but very stout also. The author of this treatise has marked this point for the last thirty years, not in the first instance from any consideration of the general principles of the animal frame, but his attention has been drawn to it in numerous instances by noticing beaten dogs to be defective in this point, almost without exception, in long courses; and good runners, to be very perfect in it.[1] Where any instance has occurred that a dog well furnished in that point, and in good condition, fails in the latter part of the course, it has immediately led him to suspect the goodness of his breed; and where information could be had, it has in most cases proved that some of their progenitors were of the brindled colour, an indication, in the opinion of many, that they are of what is termed the soft breed, or from a cross with the bull dog.[2]

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[1] Gervase Markham says of that part, - "He must be deep swine sided, with hollow bended ribs." Arrian says,—"Sides strong, loins broad," p. 84.

[2] It is not to be understood by this, that it is the goodness of the back which alone gives speed, but that it enables the dog to maintain it; the propelling power which gives speed lies in the muscles of the haunches and back jointly; and for a dog to run well those parts should be firm, with large muscular development; the contracting and relaxing power possessed by the muscle, with the aid of the feet, gives the spring forward, the tendon possessing no contracting or relaxing power; "the bones and tendon," says Dr. Ferguson,. "are merely levers acted upon and moved in various directions by the contraction and relaxation of the muscles which are inserted into them." A good back, especially midway, well supported by the two or three last ribs being well curved outwards, bears the burden alternately of the fore quarters and the hind quarters in their labour, and enables the dog to continue his propelling power. The haunches should be a good depth, with width of bone at the stifle joint; length of muscle is essential to great speed equally with quantity and firmness of it; it ought at the same time to be observed, that lengthy muscle will tire sooner than short muscle.

Many of those of the bull dog brindled colour are well ribbed out, in the way before alluded to, some of which, to use a coursing phrase, are as soft as a turnip, yet as cunning as a christian, but can go like the wind, *for a short distance*; where they run up well at the latter end of the course, it is generally from having waited in the early part of it.

In the former edition of this work, page 171, it says,—" If a cross of the genuine greyhound with the English bull dog be not advisable on account of a deficiency being thereby produced in wind and stoutness, and if the assumption be correct that that deficiency is owing to the quality of the blood being deteriorated, while experience proves that a greater speed, though but for a short time, is the consequence of that cross, there may, to breeders, be a useful hint gathered from it, in crossing one genuine greyhound with another; for, by a parity of reasoning, if on the one hand, the deficiency of wind and stoutness arise from the deterioration of the blood, so on the other hand, it is fair to presume that the extra speed arises from extra strength and muscle in some of the parts of the same animal. Experience shows that those greyhounds of a form and shape most beautiful to the eye, or what some would call, having the most symmetry in their frame, are not always the most swift, or the best in other respects; but where great muscular strength and straight good limbs are united with length and fineness of head, neck, and stern, or those parts indicating goodness of breed, although there may not be that sort of beautiful symmetry throughout the whole frame which is admired by many, are yet deficient in none of those performances which constitute a real good greyhound, and in many cases are found very superior.[1] The correctness cannot be doubted of the hint in Gervase Markham's Covntrey Farme, where he says, 'As neere as you can, make choice of that bitch which is most large and deepest chested, for from thence springeth both strength and wind.' This choice, in the female in particular, holds good in breeding all descriptions of animals, whether domestic or otherwise; and if the choice of both dog and bitch in breeding from genuine greyhounds of both sexes was extended to those whose shape in some of the parts approached most towards the shape in those parts in the frame of the bull dog, it would not be found without its advantage."

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[1] A coursing friend of great experience, and a true lover of pure blood, writes me, on the bull dog cross with the greyhound, as follows:—" Ever since our acquaintance I have considered you a man of common sense, which few very clever people possess. Now I ask you a straight forward question. Can you improve the speed of the race horse by a cross with the cart stallion? Is it possible, by crossing and re-crossing, to improve the speed? Even so it must be with the bull dog and greyhound bitch; the idea is the most absurd nonsense imaginable." And so it is, to suppose that you

When the above was written, Bergami, before mentioned, was in the mind's eye of the author, more than any other in particular. He could not be called a beauty, but was a fine powerful muscular dog, and particularly good in the point before alluded to—the midway of his body. The bull dog's ribs also generally curve very much outwards. This point in the shape of a greyhound is recommended to the attention of gentlemen of the Leash by most

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can improve the speed throughout a long distressing course; but it does not therefore follow, that the speed may not be increased for a short distance, or until the deteriorated state of the blood, from its original fineness, injures the wind, and thereby exhausts the strength of the animal; but before that exhaustion is affected, I think it possible to increase the speed by giving a greater momentum or propelling power, which a greater capacity of bone giving room for an increased accumulation of muscular development will do. There is also an impulse given to nature by a change, or crossing two sorts of blood together, which produces an increase of size, higher stature, more length and substance, than the medium between sire and dam, as is evidently seen in crossing the full blood horse with the heavy cart mare; but be those advantages of length of stride and propelling power ever so great, they cannot *maintain* their speed with one of pure fine blood. Fine blood also gives a finer texture of flesh and bone than coarser blood; bone more solid, and muscle more firm, though apparently less in substance, which although it may not give so much power of speed, it gives greater power of duration of speed, and is longer before bodily exhaustion ensues to bring on distress for wind; to which is added finer wind from the blood being finer, and its globules smaller, less obstruction is offered to the circulation in passing the multiplicity of nooks and corners in the veins and arteries when propelled by galloping.

of the ancient authors, being more particularly alluded to than any other particular point in their general shape. Old Gervase says,—"For the true shape of a good greyhound, because it is the very face and character of goodness, you shall esteem that dog which hath a fine, long, lean, snake's head, with a cleare, bright eie, and wide nostrills, a round bending necke like a mollard, with a loose thropple, and a full falling at the setting on of the shoulders, he must have a *long, broad, and square beam back,* with high round fillets, and a broad space, hee must bee *deepe swine sided, with hollow bended ribs,* and a full breast, hee must have rush growne limbes before, and sickell houghs behind, a fine, round, full cat's foot, with strong cluyes and tough soles, and an even growne long rat's tail,[1] round turning at the lower end leashward, and hee must bee full set on between the buttockes, and lastly hee must have a very long, slender, close-hid ......, and a round big pair of ...."

Arrian, as well as various other writers, particularly mentions the ribs being well curved outwards, with good long strong backs; a very little reflection will, however, readily show the indispensable necessity of a greyhound being made very powerful in that point, as it has to bear the greatest portion of the labour in the course. If you rest your elbow on a table, and project your hand forwards, without any other rest or support, and try what weight you can sustain on your finger end, you will find where the weight is too heavy, that the joint nearest the finger end is the first to give way, even were both joints equal in strength; so with a greyhound when running and stretching out forward, before his fore feet come in contact with the ground, his hind feet, like the elbow, are the prop and stay to carry the whole weight of the body, and in which it may be fairly said that the hind quarters carry the fore quarters; the hind legs and haunches carry a part, and the springing forward lies chiefly in the muscular strength of the back and of the haunches carried well down past the stifle joint and the feet, the stiflle bone being wide, allowing of a greater accumulation of muscle in its support, in addition to its portion of carrying weight; hence the necessity of the haunches being very strong and muscular;[1] but the extreme pinch of weight lies upon the midway of the body, like as with a lever scale, to weigh the heaviest weight, the regulating weight is driven along to the furthest end of the lever, only that this acts in the inverse ratio. When the fore feet come to the ground, and the hind feet are gathered up and brought forward, the fore quarters may be said to carry the hind quarters, during which, the extreme pinch of weight rests with the midway of the body again, so that the extreme pressure lies on that part both ways, with all the *necessary quickness of repetition*, and continuation throughout the course, of that repetition, besides great stress in turning sharp with the hare.

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[1] Length of tail is an indication of good breed; but where two dogs of the same breed are of different lengths in their bodies, they also generally differ in the length of their tails in like proportion. The tail is only a continuation of the vertebræ or joints of the back, the strength of which at that end joining to the body, is frequently considered, and probably with truth, as indicative of strength in the loins. There are nevertheless some few very superior greyhounds who are rather short in their tails.

As before alluded to, there is a vast many good bitches for one thorough good dog, and as a proof of the importance of greyhounds being well ribbed out, especially the last two or three ribs, let any one compare the number of bitches with the number of dogs that are well ribbed out in this way, and they will find it nearly in as great proportion as the number of good bitches bears to the number of good dogs. There are many fast dogs that are flat-sided, yet seldom stout, nor are they often well filled up at the junction of the loin and the back;[2] from such dogs no prime produce can be expected, even though crossed with a most superior bitch of perfect shape in that point; in fact, crossing one of perfect shape with another imperfect, is the opposite of utility, as the produce will be almost certain to degenerate from the perfect shaped one.

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[1] Men who are good jumpers are generally found very muscular in their haunches, and having a larger great toe than others who are not capable of jumping so high or so far.

[2] It should be remembered, that a flat-sided dog, with a narrow and confined chest, has not room for the play of his lungs, and must consequently be more pressed for wind.

If a defect is in any one particular point, the only utility in breeding from that animal must be where you can find a mate that has a redundancy in that same point; we see from Buffon, that where there is an excess of matter from any particular organ in one sex, it will make up for a defect of matter from that organ of the other sex. But where you breed from a perfect male, or from a perfect female, and the other is imperfect, if there are good and perfect produce derived from such conjunction, it cannot well be accounted for otherwise than the effect of chance, unless it may be attributed to superior rearing; being well *forced* in their tender age, and well reared to maturity, has a great tendency to make them long and strong in their backs, and to be well ribbed. As for instance, if a perfect shaped both dog and bitch have puppies badly reared, those puppies will not be so good in those parts, nor in their fore legs in particular, when grown to full age, as other puppies that are well reared, even though the latter are from parents less perfect in themselves than the parents of the other. A puppy reared on poor food has not his strength sufficiently supported; his legs are weak, and his fore legs in particular are very subject from weakness to become twisted and out of form. On this subject Markham says,—" Now in the breeding of greyhounds, there are diversities of opinions, for some gentlemen of the Leash desire a most principal bitch, though the dog be but indifferent, and suppose that so they shall have the best whelps, supposing (according to an old conjecture) that a bitch is swifter than a dogge; but it is an erroneous fancie, for the good dogge will ever beat the good bitch, and the good bitch will ever beat the bad dogge; again it is most certain, that the dogge having advantage both of length, strength and courage, he must consequently have the advantage of speed also. I do not deny but that the bitch being much lesse than the dogge (as naturally they all are) may have some advantage of nimblenesse, and so in turns, slips, and wries, may get much ground which the dogge commonly loseth; but yet, notwithstanding, when the full account is cast, the good dogge will equall all those advantages, and wheresoever the course shall stand forth long, will beat out the good bitch, and make her give over."

"There be other gentlemen of the Leash, which desire a good dogge, and respect not, though the bitch be but indifferent, and this is the better choice, yet both defective; for where there is any imperfection at all, there nature can never be fully compleate. To breed then a perfect good whelp indeed, you must be sure to have a perfect good dogge, and a perfect good bitch; and as near as you can, make choice of that bitch which is most large and deepest chested, for from thence springeth both strength and wind."

Nothing can be more true in depending on having a perfect good whelp, than the indispensable necessity of having perfection in sire and dam, either separately or united in both, for anything short of it in any one point must disarrange the whole fabric of perfection.[1] Now, in this union of perfection in sire and dam, pure good blood is most essential as a component part; for if there be one strain of inferior blood it will never entirely wash out, though twenty, fifty, or one hundred generations after it are crossed from the best known blood, it will show itself one time or another;

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[1] The perfection of any system, however beautiful, is best seen, and in its most forcible and strongest light, by comparison with a system on the same subject, but on principles of an opposite extreme in their tendency. If you put a perfect good dog to a perfect good bitch, you have, upon every allowed principle, a right to expect a perfect good whelp, though you may not have one more perfect or superior than sire or dam; doing so is nevertheless quite essential to keep the breed up to its perfection; to keep it from degenerating; if you have an imperfection in either sire or dam, the breed is sure to degenerate more or less; but if you go into the opposite extreme, and breed from imperfect ones on both sides, you will get much worse, even if this imperfection is only confined to shape; but if you add to it crossing bad shape in both sire and dam, with ignoble blood in each, you will get dreadfully bad whelps; they may, it is true, kill a hare or help to *collar her* by driving her into a snare; but as for the breed, they will be like the dreadful scourge with which Providence has thought proper lately to afflict this country, the cholera morbus, which in metaphorical language may be said

for if the softness of the breed be nearly worn away from such frequent additions of pure blood, the propensities still partially continue, as may be instanced in a litter of puppies where one of them is brindled, and all the rest black or other approved colours, and even where there have been many litters previously from the same breed without a brindled one amongst them; when that one *does come,* he soon shows, in his running, a touch of the schoolmaster, as though the propensities preponderate where the colour shows whence it came. Even this may be seen in puppies twelve or fourteen months old, of that breed which appears not so far removed from the bull dog cross, when their age is sufficient to have trials of their speed; for there is a particular style of running which a close observer will perceive when pressing the hare, and also when the other dog is leading, which betrays their artfulness; the writer has seen them at fifteen or sixteen months old *drive* a hare across a whole field, in a serpentine sort of direction, and *rush* at them when about to take the meuse, the same that an old cunning dog will sometimes do. To those coursers who want to kill hares, and nothing but kill hares, this breed may be of some value; but the true sportsman would soon treat the breed as all rogues ought to be treated, namely, *with a halter.* This propensity in the cross breed is not without its benefit, for where you see puppies run with true courage and resolution, fearing nothing, and

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to be got by Tuphus and out of Plague, as it is worse than either of its parents. It does not, however, follow, that you cannot have full perfection in the offspring without that perfection in each parent, which Markham appears to think necessary; for you may have perfection in the united shapes and size of both parents, though neither parent may be perfect in himself. I will here briefly give an example of two greyhounds that will be again mentioned hereafter, as relating to their rearing, and also being to a certain degree bred in-and-in; but this is the proper place to allude to them as to the suitableness of the cross with respect to the shape and size of each parent. The dog, Mr. Hassell's Hasper, was exceedingly large, high in stature, and very lengthy, but defective in one point where the bitch had a redundancy, also short and thick in her general frame; the produce were of medium size, very symmetrical in shape, and very superior runners, as superior to either sire or dam as it can well be imagined possible. Now this is what is termed THE CROSS SUITING: an expression in every breeder's mouth, yet how few can properly adapt their judgment to it, in selecting mates suitable to each other.

with an apparent determination to take the hare there and then at every time they run up to them, the true sportsman has the more pleasure, as he can by this contrast with the other sort rely with greater confidence on the purity of their breed. Resolute determined courage in a greyhound is as valuable as speed and shape, and either in young or aged greyhounds it is one of the first things essential to ascertain in either sire or dam to breed from; the manner in which they take the meuse after the hare is perhaps the first and best criterion of true breed, as it denotes true courage. One of a mixed breed when nearing the meuse will slacken his pace, prick up his ears, curl up his tail, and go through the meuse, but slackly; while the true breed, when once fairly entered, will dash through it without delay, but rather with increased impetuosity, and if not too small (for sometimes the meuse will not admit their getting through without sticking in it) they go through like an arrow out of a bow through a hole, and even with some meuses it is inconceivable how they can get through in that darting way; they appear to fly through them. You seldom see a greyhound go through a meuse in this beautiful style, but he also proves speedy and stout; due regard should be paid to this in any gentleman of the Leash who wants to select either for running or breeding, or both, for he cannot have a safer criterion of true breed. No spectacle can be more animating or delightful than to see a greyhound gallantly top the fences, yet in selecting one to breed from, topping is rather to be guarded against than selected for that propensity, at least where they do it in preference to taking the meuse, when there is nothing to delay or prevent their taking it, for where they show a propensity to top in preference to meusing, it betokens a want of pure blood, as it is held by many, and very justly so, to be a species of cunning, and contrary to the acknowledged and admired nature of a true bred greyhound, who runs entirely by sight, and that sight intensely fixed on the hare, and the hare alone, and who, when in sight, follows her with his utmost energy through all surmountable difficulties, not slackening his energy in the least for a moment.

Whilst topping is so greatly admired as a spectacle, and is also found to be a most useful appendage where coursing is followed in inclosed grounds, it is yet, with true bred greyhounds, chiefly an acquirement; so much so, that the lovers of the Leash find it necessary to erect in their kennels a sort of barrier or fence for the puppies to leap over to get to their food, as a means of learning them to top the fences. These barriers or fences are very useful to puppies in another point of view, as leaping over them frequently is very good exercise for them, stretching their muscular fibre, and strengthening their parts very much. Notwithstanding their being thus taught to top the fences, the true bred greyhound, when coursing the hare, goes where she goes, if not thwarted by overshooting the meuse, or in other ways; but when he is so thwarted, he instantaneously dashes at, over, or through any place that offers itself that he can by possibility accomplish, and even sometimes through the middle of a hedge where you would scarcely conceive it possible for him to pass. On the other hand, the cross breed, the knowing ones, without any previous education from their feeder or trainer, will frequently look for a place to top, when perceiving that the hare is likely to gain the meuse, though twenty or forty yards from the fence at the time he so reconnoitres it; such are apt scholars, or do it from their natural instinct, which is incompatible with the nature of a true bred greyhound. Whatever observation other coursers have made of these topping knowing ones who reconnoitre the fence before they get to it, or are impeded in any way from taking the meuse, the writer cannot say; but it has fallen to his own lot to see none that do so but those of the bull dog brindled colour, and of that colour he has seen many do it.

It may be doubted whether it is good policy to breed from any greyhounds, whether male or female, be they ever so perfect in their shape, or however great their speed, stoutness, and goodness in all their other performances, if they are bad fencers; it is possible they may have been disheartened at fences when young, by injury or bad management; but if they inherit the true courage of high bred greyhounds, such effect from injury will be overcome in their future seasons of running; but when they continue bad fencers, it betrays a defect in the blood, and, like insular cases of brindled colour where the cross breed propensity preponderates, but very few of the same breed betray the same propensity, so may this defect be an insular case, differing from the rest of the same litter. If this supposition be correct, it is a conclusive objection to breeding from that individual greyhound, as that preponderating propensity is sure to be carried down with the progeny in a greater degree than in those of the same litter who do not show that propensity.

An experienced courser, Mr. Hodgkinson, of Risley, near Derby, and who for thirty successive years has produced as good, and, some say, better greyhounds than his cotemporaries, lately inquiring of a friend if he knew of a good dog to which he could send a favourite bitch of his? His friend asked, what sort of dog he should like? "*Plenty of speed and mettle*" was the short rejoinder; this may fairly be said to combine, in a few words, all the great essentials; for you cannot have plenty of speed without good shape and good blood to render the dog stout; and you cannot have perfection of mettle in a greyhound if he does not indicate it by taking the meuse in that resolute and beautiful manner before alluded to.[1]

It is well known to many experienced amateurs, that where you have a litter of puppies from a perfect shaped and speedy sire and dam, and of known good breed, though there may be an odd one or two that proves himself but moderate, the litter, generally, are good; while, on the other hand, where the sire and dam are *not good* both in their shape and speed, and also deficient in goodness of blood, the puppies are generally but moderate, although an odd one or two may prove tolerably good, yet seldom first raters. So, in many instances, it is found that a very good running dog or bitch will sometimes prove to breed but very indifferent puppies, though the mate is selected from among the choicest greyhounds. When that is the case, there must be a defect somewhere, and the probability is, that such defect is in the blood, many instances of which are within the author's own personal knowledge and observation; amongst the rest, that of a bitch who ran nine courses at a public meeting, and won them all; she was exceedingly fast and powerful, and when once in with the hare, she dusted her about with the greatest energy and resolution, to the admiration of the sportsmen who saw her, and showed no lack of courage and determination to take the hare, except when, what is indeed the *test of courage in a greyhound*, taking a meuse; there she was conspicuously deficient. This bitch was put to the choicest dogs in the neighbourhood, but produced no first raters—a few second or third raters—and many bad ones. It also proved that many others from her dam were of the crafty sort, and in other respects much inferior to the one before alluded to. Those who course in an open country only, may deem this excellence in fencing to be but a secondary consideration; the correctness of that, however, may be doubted, as true courage in them denotes true breed, and true breed denotes stoutness, which they require in an open as well as in an enclosed country; they may, it is true, try their stoutness in the open with good hares, but sometimes those are difficult to be met with; but in an enclosed country you may see whether a greyhound denotes true breed without stout hares, as there he has the best of all tests of it—that of taking the meuse with the undaunted courage and impetuous rush which he is known to do. It is also singularly worthy of notice, and a proof of unimpaired trueness of breed, that he should retain a propensity coeval with that of the hare's natural instinct in making his own meuses for protection, when we consider that such meuses must in ancient times have been very few; and possibly only at the entrance into cover, their last resource, as enclosed grounds were then very little known, the countries being generally open. If you have by chance a wiry haired dog or bitch, that proves a very good runner, and put him to a smooth coated well bred mate, they will sometimes, for the first cross, produce good greyhounds, because you gain strength; but if you go on breeding with the produce, they prove *anything* but good; and here again is another proof of the propensity preponderating with the colour, or the fineness of the coat; for in the first cross one part of the litter are smooth coated, and the other part wiry haired; and if you preserve the smooth coated ones, you have better greyhounds to run, and may go on with the breed, and produce tolerably good greyhounds longer than if you go on with the wiry haired part of the litter; and in choosing a dog or bitch to breed from, the same as in selecting whelps from a numerous litter, the courser will not be indifferent to

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[1] This gentleman's breed of greyhounds are particularly noted for being good fencers, and those which prove not so are soon despatched from his kennel. I once met with an experienced and eminent judge of coursing, who expressed great anger at being tricked out of a greyhound puppy, and who was more especially disappointed because he considered it of that breed which indicated the purest blood of any breed of greyhounds he ever knew; "they all," says he, "fly through the meuses like a bullet." On inquiring what breed that was, it proved to be the gentleman's here spoken of. In all my coursing experience, I have not met with any one uniting better judgment of a course, of a greyhound, or of the manner of managing him, than Mr. Hodgkinson; nor one, although no member of any public coursing club, who has more universally that merit allowed him by all his competitors, having no occasion to boast of the goodness of his greyhounds; they speak for themselves.

> " The marks of their renown'd progenitors—
> Sure pledge of triumphs yet to come."—*Arrian Translated*, p. 146.

Many a courser has an antipathy to party coloured greyhounds, although it must be confessed that many excellent greyhounds are party coloured, yet at the same time it must also be acknowledged, that those of a uniform colour that are excellent, are more numerous than the party coloured ones; but supposing a case, that having two or more dogs to choose at for a certain bitch, and all of them about equal in point of shape, speed or breed, but of different colours, there can be but little doubt that the preference should be given to that dog which is the same colour as the bitch; but if, on the other hand, the best requisites were in one of those of a different colour to the bitch, I should prefer that dog possessing those requisites to the colour.

" The marks of their renowned progenitors" is perhaps of more importance not to be indifferent to, than may at first sight appear; it is a confirmation of the qualities and propensities before alluded to, of the progenitors, whether good or bad, preponderating with the colour in their descendants, as if there were a sort of adhesion between that portion of the blood belonging to the animal in which the colour originally prevailed, and the skin, the colour, and the texture of the coat or hair; or as if the greatest portion of that peculiar blood was concentrated where the same colour prevailed in the descendants. One, amongst numerous instances that may be adduced, is the experienced courser before alluded to, as requiring "plenty of speed and mettle;" his breed are descended from a very superior red bitch, given to him above thirty years ago; he has put her and her descendant bitches to what appeared the most suitable dogs, as he judged, within his knowledge, always selecting speed, stoutness, and though last not least, good fencers, without paying so much regard to shape as suitableness for the cross, though not altogether overlooking it. If the dog had the other requisites, he would probably have good shape; and knowing his own bitch to have good shape, there would not be much risk. In a litter of puppies he seldom reserved more than a brace or leash to himself; the others given to his friends; in that brace or leash he has generally secured a red bitch or red bitches, if such there was, for himself. Puppies of the same litter in other people's hands have seldom proved quite so good in the field as his own; something, however, may be allowed in this for his management of them being better than theirs; but this can scarcely be said to be the sole and exclusive cause from the first to last of a period of thirty successive years, which has generally been the case, of his own greyhounds being better than those bred by himself, but reared by others; as those others had every access to, and knowledge of his system of rearing, training, &c., and are anxious to pursue the same system from witnessing from time to time, the goodness of his greyhounds. Having been intimately acquainted with this breed, and watching their progress during most of the above period, and seeing the result, the author can advance this with greater confidence than had it been only from hearsay information; the same gentleman has now a red bitch descended in a direct line from the one he began with, the same that the inquiry before alluded to for a dog to put her to, was made, and a most speedy and excellent bitch she is. This, though more properly belonging to rearing, and the choice of puppies, applies also to the choice of sire and dam to breed from, and should not be overlooked; on the contrary, it is entitled to a preference, where those of the favourite colour are as good, or nearly so, as any others of the same breed.

Arrian says, p. 86, the colour of greyhounds is not of any importance, nor does it matter if it be perfectly black, red, or white; nor is a simple uniform colour to be suspected as ferine.

The colours, such as they are, should be bright and pure; and the hair, whether the dog be of the rough or smooth sort, should be fine, close, and soft.[1] Again, his translator adds, page 86, 87,—"Arrian very rationally combats the notion of a greyhound's excellence being at all dependant on so variable a distinction as colour. Oppian, more credulous on this point, reprobates white and black dogs as impatient of heat and cold, and gives a preference to such as are red, russet, or fawn." Again,—"in accordance with the general prejudice which bestowed superior virtue on party coloured (for such was Xenophon's opinion) Pan confers on the goddess of the chase piebald and mottled hounds," Pollux would mix a little variety of colour. The modern Cynegetica are as fickle and capricious as to colour as their ancient models. Savary gives the preference to a white hound, and is supported by Fouilloux and his copyist Turberville, who praise those of homogeneous colour—white, fallow, dun, and black, the latter being the valued breed of St. Hubert. "Of all mannere of greihoundes there be'n," says De Langley, "both good and evel, natheless the best hewe is rede falow, with a black moselle." After citing so many and such conflicting opinions, I leave the reader to draw his own conclusion on this unimportant point, bidding him remember that Markham supports our author, that "colours have (as touching any particular goodnesse) no preheminence one above the other, but are all equal—many good and famous dogs having been of all the several colours; only the white is esteemed the most beautifull and best for the eie, the black and fallow hardiest to endure labour, and the dunne and brindled best for the poachers and nightmen, who delight to have all their pleasure performed in darknesse." Backed by the compiler of the Country Farme, let him give to Arrian the weight he is entitled to, as a practical courser. "My own conviction," says the translator,

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[1] Arrian's translator adds a note, p. 88, in which he says,—"The rough or wiry haired variety of greyhound is banished from the kennel of modern coursers, for although they may show some fire and speed in a short course in an enclosed country, it is always beaten by the smooth greyhound over a champaign country, where the duration of the contest defies ignoble competition.

"accords with that of Tardif. I object to no dog merely on account of his colour, though he may rival in variety of tint the renowned Triamour's marvellous Petierewe."

Much as I admire the ability and assiduity of the Translator of Arrian in bringing to view so many eminent authorities on this point, as well as others appertaining to the Cynegeticus, I cannot altogether agree with him on this. Arrian says,—"The colour of greyhounds is not of any importance;" and Markham says, that "Colours have (as touching any particular goodnesse) no preheminence one above the other;" so far, Markham supports Arrian. The latter, however, says,—"Nor does it matter if they are perfectly black, red, or white; nor is a simple uniform colour to be suspected as ferine." And although he says nothing of the brindled colour, yet by the term "a simple uniform colour," which brindled cannot be deemed, we may rationally suppose that he considered some colours as suspicious of ferocity, or of a savage nature, like the bull dog; and Markham gives the several uses to the several colours, as "white most beautifull and best for the eie, the black and fallow hardest to endure labour, and the dunne and brindled best for the poachers and nightmen."

Arrian says, p. 88,—"The best dogs are such as are large and well put together, and resemble bitches in point of suppleness; and the best bitches are such as resemble dogs in spirit, and muscularity of body."[1] With respect to "a uniform colour not being suspected as ferine," it is evident from his following remark that he considered ferocity in a greyhound indicative of bad breed, and consequently any colour indicative of ferocity to be objectionable, which the bull dog brindle certainly is. He says,—"Nor will the temper of greyhounds afford fewer indications of good and bad blood to a careful observer. Such hounds, in the first place, as are crabbed to all persons alike, are not of a generous breed. But if you find any cross to strangers, and good tempered to their feeder, it is rather a favourable sign than otherwise. I once knew a greyhound who was dull and sullen at home, and took no pleasure in any of the persons about him; but when led out hunting, was beyond measure delighted, and showed by smiling and fawning at every body that came near him that he was vexed at staying at home. This may be held a good sign. The best dogs, however, are those of most attachment to man, and to whom no human countenance is strange.[1] Such, on the other hand, as are afraid of people, and astounded at noise,[2] obstreperous, and often excited without cause, are senseless brutes of no pluck. Like men that are timid and frightened out of their wits, such dogs as these can never be deemed of generous blood." An instance, amongst many which occurred in the kennel of that careful and nice observer of every thing denoting good or bad breed in a greyhound, the late Mr. Mundy, may be here adduced, of the propensity going with the colour. A yellow dog he had, and of a favourite breed, very speedy and good in his running, but was slightly marked with brindle colour in one or two places on his body; being only so slightly marked with the colour he had such an antipathy against, he dispensed with it for some time; but the dog had a way of gratering his teeth, when he had flung at a hare and missed her; Mr. Mundy was near enough on one occasion to hear him, which confirmed his suspicion that he was from a cross, however remote, with the bull dog breed, and consequently he soon parted with him, giving him to Lawley, the gamekeeper to Lord Vernon for a buck dog. Major Topham's Snowball was a jet black, and some say that Major and Sylvia of the same litter were brindled; but the Stud Book gives Major as black; be that as it may, it is singular and worthy of notice, that while Snowball and his descendants are recorded in the Stud Book as having won a great number of cups and other valuable prizes, we look *in vain* for any of such prizes being won by the descendants of Major or Sylvia. The translator of Arrian says, in a note, p. 299,—"It is worthy of notice, that, whereas the earlier Latin and Greek Cynegetica recommend heterogeneous commixture in breeding for the chase—crossing the canine families of different countries with each other, under the hope of improving the pure *indigenæ;* Namesian contends for parity of sort, and purity of blood, to supply the greyhound kennel, as if aware, with the modern courser, that the essential attributes of the Celtic type would necessarily be impaired, if not annihilated, by the admixture of alien blood. Arrian's silence, too, on the subject of omnifarious copulation, indicates a conviction of its inapplicability to breeding for the Leash."[1]

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[1] He says, p. 89,—"Those, too, are bad, which, when let loose from couples in a field, do not come back at the call of their keeper, but gallop away. If you call them in mildly, they pay no attention to you; if threateningly, they keep aloof from fear. For when a greyhound has had his gallop, and has run about, he ought to come back to his keeper, even without a call, showing that he is under command at will; but if the keeper does not choose to take him up, let him again bound away, and again return. Such dogs are well broken in as, at the voice of their keeper, crouch before him;* not from fear, but regard and respect for their feeder, cowering like the worshippers of the great King. It is no good sign for a hound to stand still, when let out of couples on an open plain, unless he happen to be advanced in age, for it shows sluggishness.

* Cowering low
With blandishment.——*Paradise Lost*, Book viii. p. 351.

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[1] The best greyhounds are the most kindly affectioned. Martial's Lydia was gentle at home, but savage in the wood; and De Langley's greyhound, "curtaise and nought to fell, well folowyng his maister, and doing whatever he him commaundeth. He should be good, and kyndly and clene, glad and joyful, and playeing wel willyng, and goodly to alle manner of folkes, save to wild beastis, upon whom he should be felle spitous and egre."

[2] "Start at the starting prey or rustling wind."

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[1] That the colours and propensities will adhere together in some measure in the different varieties of one litter, is clear to a demonstration. If you put a high bred smooth greyhound dog to a wiry haired bitch, one part of the whelps will be smooth, with a little wiryness in detached parts, and the other wiry; and you generally find the dog whelps smooth, and the bitches wiry; if you choose the smooth ones, you may have a very speedy good dog amongst them, as you gain strength and hardiness to high blood with more delicacy; but to re-cross them with one of a cross breed, it degenerates, and you seldom get any thing worth having, *after the first cross.* I know a singular instance in the human species:—one daughter in a family is very different to the other daughters in form and features, in voice and manner, in disposition and temper, and in size, and other things. Their father had an aunt, equally different to her sisters, and *precisely in the same manner.* Her voice was just like the younger of the two; her walk, her temper, and all her ways; and this could not be by the younger adopting those ways by imitation, as she had never seen her father's aunt in her life; it must be a sort of preponderating influence in the blood from her progenitors, whom

Now Markham mentions dunne and brinded as proper for poachers and nightmen, and certainly some bull dogs are of a dun, or, what some would call, a light fawn colour; certain it also is, that poachers, to this day, get greyhounds crossed with the bull dog, and re-crossed with the greyhound, whenever opportunity offers, for their own particular purposes, finding him the most useful sort for that purpose. At how long an anterior date this has been practised, or how far it has extended in unintentional commixture in the kennels of true sportsmen, or how far sportsmen have themselves intentionally bred from greyhounds of this cross, from their speed (while their ignoble blood will not allow their wind to last) winning short courses, on the calculation that there are many more short courses than long ones; or what portion of modern greyhounds are of an entire pure and original breed, must, under all the conflicting opinions and variety of circumstances on which those opinions are founded, remain a matter of mere conjecture; we have, however, ocular demonstration on the point to a certain extent, by different breeds, under the same tuition, showing different propensities, a difference of stoutness, a difference of colour, and a difference in the goodness of their progeny, and with a community of sentiment and intelligence amongst amateurs, a decided preference is given to those which indicate a purity of blood, the rational conclusion from which is, that the pure breed, or those most remotely crossed with ignoble blood, are by far the greatest in number, and that the growingly emulative spirit for pre-eminence of their kennels among true sportsmen has discountenanced any ignoble cross, and will continue to do so for the future; and that the breed has been, and will be continued in its greatest possible purity.

So far as the colour is concerned in choosing sire or dam, or both, I would, in the latter case, where other circumstances of speed, breed, shape, &c., do not interfere, pay some regard to

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she resembled over those of others, in the germ of the seed when she was generated. When such is the case in dogs, there the colour, propensities, and qualities of that progenitor are united, and preponderate over the blood of the other progenitors.

a similarity of colour between them, at the same time not overlooking "the marks of their renowned progenitors," should such exist in the number of sires or dams that offer for choice of them; but separately, that is, in choosing a sire, that regard should be had to the colour of the most renowned progenitor on the side of the previous sires, grandsires, &c. in preference to that of the dams; and in choosing a dam, the preference should be given to the colours of the previous dams, grandams, &c., as the dog is more prone to inherit the qualities of the sires than the dams, and the bitch more prone to that of the dams than of the sires.

With respect to Oppian's reprobation of white and black dogs, as impatient of heat and cold, he may mean that the white is impatient of cold, and the black of heat;[1] and certainly white ones are considered more delicate than others, and the black, red, or fawn coloured ones, more hardy. The physical or philosophical reason for such variety, if such really exist, I must leave others to determine; and although without any pretensions to knowledge of that kind, I may be allowed to hazard a conjecture upon the subject, from which the reader can draw his own conclusion. If you lay a square yard of black cloth, another of red or scarlet, and another of white, of equal texture and thickness, on the snow, you will find, when they have lain some time, that the snow will be more wasted under the darker coloured cloths, than under the lighter coloured; and in proportion to the different shades of light or dark, under the black more than even under the scarlet; this may be the effect of more or less heat being contained in the articles composing the different tints, which may not apply to the colour of the animal's hair as formed by nature, and as such, is not a parallel case. But there is such a thing as chemical affinities, and a greater or less attraction of different bodies to each other, and therefore without any extra heat being contained in the articles composing a darker tint than a light one, if a dark colour has a greater attraction to heat than a light one; a black dog may be more impatient of warm weather, while a white one is more susceptible of cold than a black one, and the different shades of colour between them, in proportion. As such, a preference must certainly be given to dark coloured greyhounds than to light, as in this country these animals in modern times are more particularly used in the coldest months in the year.

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[1] "Ancient sportsmen were accustomed to follow their field sports through the whole year, and often prolonged the chase till midnight. But the more humane of modern days have abridged this perpetuity of warfare with the animals of the field and forest by legislative enactment. Namesian alone of all the cynegetical writers of Greece and Rome, enjoins us to commence coursing at the period now usually adopted. Dame Juliana, seemingly careless of her hounds' impatience of heat, held on till midsummer. Natalis Comus allows us to sport during the whole spring; but the prudent and humane courser will not slip his greyhound later than the month of February."—*Arrian's Translator*, p. 102.

With respect to good or bad breed being denoted by colour, I should certainly put my own forbidden stamp on the bull dog brindled colour in particular, and nowise encourage the light dun—the former I would not have amongst a kennel of good greyhounds on any consideration; it would be like associating the blackguard with the true gentleman. The black is a favourite colour, and is found by the Stud Book to stand pre-eminently high in the list of winners; the red, russet, and fawn, are good colours, and any of those colours indicate good breed. Blue is esteemed by many, but objectionable with some colour fanciers, and as is said of a horse, a real good dog cannot be of a bad colour; such, however, has never yet fallen to my lot to see one of the brindled colour, that can be called a real good one in speed, stoutness, and honesty combined, unless I may deem Mr. Harries's Humblebee a real good one; she has won two cups and three stakes, and I have never seen or heard of her running otherwise than honest and true. Her great grandsire was of the bull dog brindled colour; but she must either be considered an exception to a general rule, or the blood of her other progenitors must prevail principally in her. If a brindled colour can be called beautiful, her colour may; slight, narrow brindled marks nearly all over her, on a beautiful fawn ground; altogether, her performances and her general looks, without the least sourness in her countenance, have induced me to solicit her owner to favour me with her portrait, which he has very kindly done, from which to take an engraving for this work.

Now, the best dog does not always win; yet the average of winning is the surest criterion we have of goodness, as it is only occasionally that the best dog, by some casualty, wrong decision, or otherwise, is decided against. Then, as winning is the best criterion, the Courser's Manual or Stud Book affords a tolerably correct clue by which to ascertain whether any preference ought to be given to any particular colours, and to which of them; for which purpose I have carefully selected the number of winners of each colour, making a distinction between those of uniform colour, and those which are party coloured.

Of 1352 greyhounds entered in that work as winners of 1830 prizes, 617 are black or black and white; 318 red and fawn, or those colours and white; 134 blue or blue and white; 57 yellow or yellow and white; 81 brindled or brindled and white; 23 cream colour; 75 white, and 47 colour unknown. Of these 1352 winning greyhounds, only 281 are party coloured, including those with white ticks amongst the uniform colours, as those white ticks are sometimes thought to be owing to there being ticks or fleas in the kennel when they were whelps.

What are the relative number of greyhounds in the kingdom of each of these colours, I cannot say; but no one, I should think, would have the assurance to assert, that black prevails to such a very great disproportion over the other colours, as the winners of those colours prevail over other colours, and therefore we must conclude black to be the best colour, at least in this country, however it may be in warmer climates, which favours the idea that a black colour has a greater attraction to heat than light colours have, and that in the winter season they do not suffer so much from the coldness of the weather.

I have, however, been induced to examine this matter more particularly, from having on many occasions at coursing meetings remarked, that, although there may not be above five, six, or seven black greyhounds entered for a cup where sixteen dogs contend for it, there are often three or four black-and-all-black left to contend for the two last classes, having beaten off the other colours as well as their own party coloured ones. A reference to a number of coursing return lists will confirm the correctness of this statement to any of my readers who will take the trouble to examine them. This statement shows an evident result in favour of black over other colours, and of uniform over party coloured, the uniform in the proportion of nearly five to one of party coloured.

Some people think that a brindled dog is not so much an indication of a cross with a bull dog, as it is the effect of mixing colours of different hues, such as putting a black dog to a red bitch, or a blue to a fawn colour; but this supposition seems only imaginary; not warranted either by reason or fact; for if it were, we should have them with stripes of those various colours; we should have all the colours of the rainbow in one dog, of which I have never seen or heard of an instance. We have the darker or lighter shade of brown stripe, common to the bull dog; and is sometimes upon a fawn ground. We have black and white, blue and white, red and white, yellow and white, cream colour and white, and even brindled and white; but we have not that *white in stripes*, as is the case in what is termed brindled; neither have we one stripe black, another red, another blue or other colours, nor have we the same silky fineness of coat in the brindled generally as in other coloured dogs, nor can the position of brindled, as arising from the mixture of colours, be a tenable one.

Brindled cannot be deemed a uniform colour; and it is curious that the other party coloured dogs are so party coloured by having white marks, larger or smaller; not black marks and red marks, or blue and fawn or other coloured marks on the same dog, but black and white, red and white, and so on; and as the uniform coloured dogs show a superiority in winning of five to one over the party coloured, it seems to show an inferiority appertaining to white, which I feel at a loss to account for, as those which are *all white*, in comparison to the number we see of white greyhounds, and that number small, show a fair proportion of winners in the Stud Book; I will therefore leave that *hare sitting*. If, however, I had a party coloured bitch to put to a dog, and had the choice of two dogs for the purpose, one party coloured and the other a uniform colour, all other qualifications of shape, speed, breed, &c. being the same in each dog, I would prefer the uniform coloured dog, and should expect to have a greater number of uniform than party coloured puppies from them. But if any one can doubt the generality of brindled greyhounds being descended from a cross with the bull dog some time or other, however remote, their countenance and shape of the head and nose will, in most cases, satisfy that doubt; they have not that docile, gentle, and kindly affectionate look which the true bred greyhound is so generally admired for; they look as sour as a bull; and if they do not exactly *snarl* at you, they turn up their nose as if to *sneer* at you, and as if a very little provocation would cause them so seize you by the nose as the bull dog does the bull. This is not confined to those only which are of a brindled colour; most of those of the same breed of other colours have a similar countenance, and show their breed by their features.

I called with a gentleman to look at Mr. Hassall's greyhounds, who showed us, besides others, a lot of seven or eight very fine looking black puppies, fifteen to eighteen months old, all by Harold, but out of different bitches, most of which were well known to me. Laying my hand first on one and then on another, one of them (and he appeared to me as fine shaped and powerful a puppy as any of them) gave me so repulsive a look, that I drew back from him, and said, "What have you got here? He looks like his master when a course has just been, unjustly as he thinks, decided against him." "Why," said he, "that puppy came out of a brindled bitch that I had out of Yorkshire." "Oh! very well," said I, "that accounts for his surly looks; but I did not know before, that you associated the blackguard with the true gentleman." No one need study the countenance of the two different breeds for any length of time without discovering the evident and glaring difference between them; nor need any better proof be adduced of their ignoble blood. I could not be prejudiced against this puppy, and therefore only *fancy* that he was of sour countenance, for until this sourness struck me so forcibly as to make me draw back from him for fear of being bitten, my pre-conception was in his favour. He had not only a sour, surly countenance, but his nose *turned up*, and rather blunt than pointed.

The morning after his late sale of greyhounds, being disappointed of purchasing a dog I had intended for a friend, and he having a few that did not sell, offered me a very powerful fine looking eighteen months' red puppy, which I did not then know was out of this brindled bitch, until observing his *cocked up nose,* I bluntly answered, "that I would not have him if he would give him to me." He put me in mind of two lines in the old hunting song, called "Batchelors' Hall:"—

> "Then for hounds we have Nimble so well that climbs rocks,
> And Cocknose a good one at scenting a fox," &c.

If I had wanted a greyhound for scenting a fox, he might have answered my purpose very well; but for a greyhound to course a hare, and to breed from for that purpose; I should say, "from such as he good Lord deliver me."

I know that Mr. Hassall had some puppies from this bitch old enough to run, and he did run them the season before this; but I never heard of their winning either cup or sweepstake; nor do I know what is become of them; they were not in his catalogue of sale, as those in the catalogue are eighteen months' puppies, or a latter litter than the other, of which there were five, three of which sold for eight pounds, and two not sold, while many of those out of his well bred bitches sold for high prices, thirteen of which averaged twenty pounds each. I should hope that this sale will cure him of any brindled mania he may have had upon him. I would not thank any gentleman to make me a present of the most speedy, powerful, or fine shaped greyhound in England, to breed from, if he had a sour countenance; he might do to win a cup or sweepstakes, but I should derive no solid satisfaction or pleasure from him, nor feel anywise proud of the prize, not being won by a greyhound of the true breed.

Arrian says, p. 75,—"I will specify the indications of speed and good breeding in greyhounds, and by attention to what points ill bred and slow ones may be distinguished from them. In the first place let them be *lengthy* from head to tail;[1] for in every variety of dog; you will find, on reflection, no one point so indicative of speed and good breeding as length; and on the other hand, no such mark of slowness and degeneracy as shortness; so that I have even seen dogs with numerous other faults, that have been, on account of their length, both swift and high couraged. And farther, the larger dogs,[1] when in other respects equal, show higher breeding than small ones, on the very score of size. But those large dogs are bad, whose limbs are unknit, and destitute of symmetry;[2] being indeed, when so formed, worse than small dogs, with an equal share of other faults attached to them.

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[1] Length of body is insisted upon by the ancients as essential and as necessary to perfection of form. Such a structure is generally indicative of speed; and as an example, the writer may specify a high bred greyhound in his own possession, 5 feet 2 inches long.—*Ex. Arrian's Trans. note* 2, p. 75.

Your greyhounds should have light and well-articulated heads;[3] whether hooked or flat-nosed is not of much consequence; nor does it greatly matter whether the parts beneath the forehead be protuberant with muscle. They are alone bad which are heavy headed, having thick nostrils, with a blunt instead of a pointed termination. Such then are well headed hounds. Their eyes should be large, up-raised, clear, and strikingly bright. The *best* look fiery, and flash like lightning, resembling those of leopards, lions, or lynxes. Next to these are black eyes, provided they are wide open and grim-looking; and last of all, grey.[4] Nor are these to be considered bad, nor indicative of bad dogs, provided they are clear, and have a savage look; for I have myself bred up a hound whose eyes are the greyest of the grey; a swift, hard working, courageous, sound footed dog, and, in his prime, a match at any time for four hares. He is, moreover (for while I am writing he is yet alive) most gentle and kindly affectioned.

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[1] Translator says, "Our most distinguished modern greyhounds, as Millar, Snowball, and others, have been large dogs, *lengthy*, muscular, and *low on their legs*.

> "Who knows not Snowball? He whose race renown'd
> Is still victorious on each coursing ground?
> Swaffham, Newmarket, and the Roman Camp,
> Have seen them victors o'er each meaner stamp."

[2] "The greyhound should not be high on his legs, nor loose made."—*Translator of Arrian*, p. 76.

[3] "Xenophon reprobates hook-nosed hounds—Pollux would have the heads light and airy; and Markham says, he should have a fine, long, lean head, with a sharp nose, rush grown, from the eyes downwards."—*Arrian's Translator*, p. 77.

[4] "Oppian particularly specifies blue eyes as preferable to all others; and," says the Translator of Arrian, "I have known many azure-eyed dogs

Let the ears of your greyhounds be large and soft, so as to appear, from their size and softness, as if broken.[1] Such are best; but it is no bad indication if they appear erect, provided they are not small and stiff. The neck should be long, round, and flexible, so that if you draw the dogs backwards by their collars, it may seem to be broken, from its flexibility and softness. Broad chests are better than narrow ones. Let them have shoulders standing wide apart, not tied together, but as loose and free from each other as possible; legs round, straight, and well jointed; sides strong, loins broad, firm, not fleshy, but sinewy; upper flanks loose and supple;[2] hips wide asunder; lower flanks hollow; tails fine, long, rough with hair, supple, flexible, and more hairy towards the tip; haunches sweeping, and firm to the touch. With regard to their legs, if the hind ones are longer than the fore ones, the greyhound will run best up hill; if the fore legs are longest, down hill; but if equal, he will run best on a flat. Since, however, it is more difficult to beat a hare on an acclivity, because she

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of great merit. The darker the eye, however, the better; her eynne should be, according to De Langley, 'reed or black, as of a sphauke;' full and clear, with long eyelids, according to Markham."

[1] The *conque* of the ear is semi-pendulous, and yet the greyhound has the power of elevating it with as much ease as the less reclaimed varieties of dog. This particular structure gives the appearance noticed in the text, of the ear being broken; and also adds to its seeming magnitude. Old Gervase says,—"A sharp ear, short, and close falling."——*Arrian's Translator*, p. 82.

[2] Upper flanks, according to Arrian and the elder Xenophon, are that part of the lumber region, behind the last or short ribs, where the kidneys are situate.

runs best up hill; those are deemed the better class of dogs whose hind legs are longer than their fore ones. Round and strong feet are decidedly best."[1]

The subject of one greyhound having longer fore legs than hind ones, and another having longer hind legs than fore ones, is, I must confess, new to me; nor am I prepared altogether to admit the hare running up hill better than down, is so much caused by her fore legs being shorter than her hind ones, as being caused by her fore legs being very weak as well as short, while her hind legs are both long and strong, and give her the power and speed to run fast up hill, when the fore legs have but little pressure, and the lighter and shorter they are, the more handy to get forward; while in running down hill, they have great pressure to bear, by the force with which the weight of her whole body comes upon them, from the strength and length of bound of the hind legs and quarters, wherein lies her greatest power; she feels this pressure in running down hill, and will not continue to do so longer than she can help. She also feels her advantage in running up hill, and therefore prefers it. The hare goes in a manner by jumps, whether up hill or down, which the power and length of her hind legs and haunches enable her to do. Not so the greyhound; he has seldom, except when occasion to jump, *all his four feet* off the ground at one time, the fore feet coming to the ground when the hind feet leave it, especially in running up hill, in which his fore legs have as much pressure upon them, and as much occasion for strength in them, together with his fore quarters, as at any time, in supporting the weight of his body while gathering his hind legs forward, or drawing them up hill, and doing that with great quickness.

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[1] "A round foot, and good large clefts," says Markham; and again he says, "A fine round, full cat's foot, with strong cleyes and tough soles." "Bad footed hounds, however high couraged, are unable to bear work," according to Xenophon, "on account of the pain they endure while running."—Gratius says,— "No Cynegetican omits the essential feature of a well formed foot; which in Wase's words, should be 'round, high knuckled, and well claw'd, with a dry, hard sole.'"

The question of the shape of a greyhound best calculated for running either up or down hill, does not rest on the relative length of the fore legs with the hind ones, but on the length and strength of the back, as compared with the length of legs.—Indeed, this is an important consideration in running on any ground, whether hilly or flat; long in the legs, and short in back; or long in back, and short in legs, may come to much the same point in length of stride; but on the quickness of repetition, depends the speed, equally or more so, than on the length of stride; and further, where the greyhound is deficient in capability or power of quickness in repeating his stride, he is deficient in the power of laying himself *well out*, so as to take a long stride; but without considering that part of the question, if quickness of repetition was not as essential to speed or more so than length of stride, how is it that we so often see little bitches *out race* lengthy dogs, independent of their being better turners? The superior nimbleness in turning, from the smallness of their size, compared with that of the dog, gives the bitch an advantage over the dog in winning the course, so that the number of winners of each recorded in the Stud Book is not an exact criterion on the comparative speed between them; yet *we do see* quite small bitches *out race* lengthy dogs, and sometimes in the first run up to the hare before the dog can be weakened by turning;[1] but where you see a small bitch out race a lengthy dog in the first run up to the hare, you will, nine times out of ten, find the dog deficient in the back, and particularly in that part before alluded to, the middle or junction of the loin and back. This applies to running on flat as well as hilly ground. It is, however, the strength of the back which is brought into requisition in particular, in running over hilly ground; and here may be said to rest the distinction between long or short backs, supposing BOTH to be good and strong: the more lengthy the back, and proportionably strong, the more he is calculated to beat the shorter backed dog on the flat; but on hilly ground the shorter backed dog will have an advantage, as, to use the phrase of that celebrated, and I may say, scientific courser, the late Mr. Mundy, the longer backed ones cannot *buckle and unbuckle so quick* as the shorter ones; this quickness on hilly ground as compared with flat, is more requisite than length of stride, besides which, the shorter dog has more power to raise himself up to mount the hill than the longer one, and to bring his hind legs forward, the extreme ends of both fore and hind quarters act as a lever against his middle, in the inverse ratio to a lever lifting a weight by a long purchase, and the longer the lever, the greater the purchase against him; consequently the longer the back, the longer the lever against his other powers called upon to resist it.

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[1] The winners in the Stud Book are about the portion of seven bitches to six dogs.

With respect to their "shoulders standing wide apart," as Arrian observes, "not tied together, but as loose and free from each other as possible," it is a matter well worthy of attention, as without that they lose much ground in turning, besides distressing them the more; and he might have added, the looser they are just behind the shoulders, the better for that purpose, and without any disadvantage to their speed in straight forward running, but rather to the contrary. The "mayster of game" is here not over correct. He says, p. 84,—"The boone and joyntes of the chyne greet and hard as the chyne of an hert. Eke be reason his chynne shuld be a litel hie, for it is better than it were flatt," &c. Greyhounds of that shape generally run high, nor is it to be wondered at when fast and strong made in that point; they have not the necessary liberty in their shoulders to lay themselves out with their heads near the ground as a fast running greyhound generally does;[1] and in turning, close and fast-made shoulders is a still greater disadvantage. When the hare, finding herself closely pressed, doubles quick back to avoid the greyhound, his head is turned towards her, notwithstanding his body is still in the contrary direction; but that part of his frame which allows his head and neck to be directed towards the hare at that momentary crisis, is the looseness of the shoulders, which are also partly turned, and the pliancy in his chine, that enables him to do so; next follows the strength of the loin and hindermost part of the back, to enable the dog quickly to complete the turn of his whole body. Nor is length of back less essential in enabling him to turn well, although some suppose that short backed ones with a good loin would turn quicker than long backed ones; but this must be founded on mere supposition, or without due consideration, and certainly not founded on experience with careful observation.

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[1] It has always been the *wonder* of the greyhound that he is able to dart through a small meuse after a hare in the flying manner which he is known to do; and was he not enabled by the peculiar looseness of his shoulders to project his fore legs straight forward, and to place his head and neck between his fore legs while doing so; it would be impossible that he could effect that most beautiful and highly essential performance. I will recur to the shoulders hereafter.

I knew a gentleman who had four or five brace of greyhounds, who utterly condemned the long backed ones as bad turners, from the circumstance of one of his dogs being longer on the back than the rest, (except one other which had recently come to his kennel,) being a bad turner; and had I not been already well convinced by many years' noticing this point, I could not wish a more satisfactory instance than this gentleman's kennel afforded me; it must, however, be observed, that I had never seen this gentleman's greyhounds run, either before he made the remark to me, or after; but before he had mentioned that to me, I had seen his servant with them at exercise on the road, and had noticed the two longer backed dogs, and remarked the difference of their make in that point, the other being loosely made about his shoulders and chine, and looked like every inch a good one; and on his saying that he had one that lost at least twenty yards at a turn more than his others, I asked him if it were not the black dog that was very strongly made about his shoulders and chine? He acknowledged that it was the same; I requested him to run the other long backed one against him the first opportunity, and notice the difference in their turning; it is no easy matter, when a man has formed a certain opinion, to convince him of his error.

> " Convince a man against his will,
> He'll hold the same opinion still;"

says Hudibras. In this case, however, it was not so; for the next time I saw him, he became a convert; the other long backed dog was not only a better turner than the black one, but he was the best turner of any dog he had, and altogether the best in his kennel.

Besides my own observation in the field, there are many other instances where I have seen a kennel of greyhounds, none of which I had ever seen run, where I have pointed out greyhounds not likely to be good turners, and which were acknowledged to be correct; a very little reflection, however, will show that this fact, as proved by experience, is supported by plain reason, not only as to the looseness or fastness of the shoulders and chine as before explained, but the length or shortness of the back also. There is a certain flexibility in the back which admits of its being brought into a curve, and the longer the back, the greater must the curve be, consequently the longer the back, the more it must admit the shoulders and fore part of the body to be brought in the direction towards the hare, and so much better prepared, by the next effort, to complete the turn. This curve is formed in one effort, be the back long or short; and this question is distinct from that of whether one dog goes with greater velocity than another, and the consequent further overshooting the hare; for a short backed dog may fling himself at the hare with a velocity equal to a long backed one; in which case the long backed one will turn and recover himself on his legs straight after the hare in less time than the short backed one. A long backed horse will turn in less room than a short backed one.[1]

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[1] Where the bony structure is lengthy, there will be lengthy muscle; and length of muscle is essential to speed; short muscle will not tire so soon as long muscle; hence, in close or short work, short muscle in plenty is preferable to long; as in rowing, a lengthy man that will beat a short one in running or jumping, will be beat in his turn in pulling away at the oars for a length of time: in slow work, as drawing a load, a compact, short, well-built cart horse, will tire out a lengthy one, the latter having no more advantage from his length than the increased weight consequent upon it, which may possibly enable him to draw a greater load for a short time, but he will be tired sooner. There being so much greater proportion of muscle in the back and quarters than in the legs, is one reason why length of body should be preferred to lengthy legs, especially below the knee and cambril joint.

But with respect to long backs and short legs, or short backs and long legs, there certainly is a proper medium to be observed in arriving at the best shape possible, which medium it is difficult to ascertain, and it is also difficult to ascertain the proper proportion of length of each, the length of legs with the length of body, which varies in a considerable degree; and what increases the difficulty is, the deception to the eye as to the length of the legs compared with the length and thickness, or robust shape of the body; a long backed dog may appear to the eye to have shorter legs than another dog that is shorter on the back, when in fact his legs are equally as long, or possibly longer; the same appears in the comparative length of back in two different dogs, where one is of a slender frame, and the other robust. I have seen this tried several times, where one appeared to the eye longer than the other, and have set them close together, shoulder point to shoulder point, and sometimes found very little difference in length of body, and at others none whatever.

In measuring the length of a greyhound, it is *possible* to measure the relative length of body, with that of head, neck, or stern, with the different joints in the legs, severally or jointly, and compare each variation with the variation of each of different dogs' speed, and so forth; but this would be very abstruse; and as we know from experience, that, without being long in those parts of back, head, neck, stern, &c., they can neither be very speedy, nor appear very high bred; the whole length, therefore, from nose end to tail end, will answer the same purpose equally well, and the proportion of the whole length, with that of the height, will be equally conclusive, and more simple, as to their relative speed and powers, than the more minute particulars of each part separately.

This, however, is not the true criterion for length of stride—of which more hereafter. The translator of Arrian, as before quoted,

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An experienced courser says, he never in his life saw a greyhound that could, in a manner, fly up to his hare, that could run a long course well; they soon tire, simply because they have great speed from lengthy muscle.

says,—"He has a high bred greyhound in his possession, five feet two inches in length;" but says nothing of the height, nor of the relative length and height of dogs, compared with bitches; but having ventured an opinion that there are many more good bitches than good dogs, and also that good bitches are better than dogs, in the same proportion as they are better made in their backs, and their ribs better curved out; and further, that bitches are longer in their backs in proportion to their height, than dogs, I have caused some known good ones of both sexes to be measured; also weighed, as that criterion is not to be overlooked, on several considerations, the latter applying more particularly to training.

From the manner in which the translator of Arrian mentions the length of his dog, we may infer that he considered him a dog of great length. Mr. Hassall's dog Harold, who has won a prize at every public coursing meeting where he ran, is five feet four inches long, two feet two inches and an eighth high, and weighed when in coursing condition 66lb. Harpalyse was an exceedingly good bitch, and a winner, five feet one inch long, two feet and two-eighths of an inch high, and weighed 56lb. So that while the bitch is 10lb. lighter than the dog, or one part in six and a half, she is one inch seven-eighths lower in stature than he is, or one part in fourteen, and three inches shorter, which is only one part in twenty-one; showing an evident increase in proportion of height to weight, and about an equal proportion more of length to height.

Hasper, by Harold, out of Harpalyse, the first litter she ever bred, which took place when four or five years old, is five feet seven inches long, two feet two inches and five-eighths high, and weighs 70lb.; by which it appears, that although only half an inch higher than his sire, he is three inches longer. The size and power of this dog is worthy of attention, as far as regards the age bitches should be when first put to the dog to breed. Harpalyse was twice put by from taking the dog when at heat, consequently did not breed any puppies till she was upwards of four years old, and all the puppies she has bred have been remarkably strong ones. This should be borne in mind when we come to the question of the proper age to breed at. The general length of frame and height of a dog do not indicate the greatest power of taking the longest stride, which, it must be admitted, with other parts well furnished to support repetition of those strides, is a most important point towards giving great and good speed. There is a certain symmetrical proportion throughout the whole frame, necessary to give the longest possible stride and the best speed. The greatest length in those parts which gives length of stride, will not do it without a corresponding strength in other parts to enable him to stretch out his frame to the greatest length.

I have seen boys, and even men, trying which could reach furthest on the ground with one hand only, the other arm laid behind the back, placing their feet at a certain point, and stretching out their bodies and arms to reach as far as they could with their fingers, without allowing any part of their bodies to touch the ground, shuffling their hands along as far as their general strength would support their weight; in these trials I have very often seen the tallest far outreached by those of much lower stature. This is in close analogy with a greyhound taking the longest stride; the principal point requiring the greatest strength to support the weight when stretching out, is in that part before alluded to, the junction of the loin and back, well supported by the ribs. It is one reason why little bitches often run as fast or faster than large ones, or than large lengthy dogs; if the relative length of stride of the two sizes were measured, it would often be found that the smaller one strode as far as the larger one. The weight of the whole body has to be taken into account, and the greater the length of frame, the greater is the weight to be supported in that stride by the connecting parts of that frame, consequently the largest dog must be correspondingly strong in those parts to enable him to reach a corresponding or greater length than the smaller one, but which corresponding strength is very rarely found possessed by very large ones. The goodness and strength of the loin, and its junction with the fore part of the back and ribs, as before explained, are here brought into requisition, as well as great muscular strength in the haunches, and next to them, the muscular strength of the arm and shoulder; good firm muscular development being absolutely necessary in all those parts to support the weight of the body.

It is this symmetrical proportion in shape, and corresponding muscular strength giving a predominating power over the weight of the body which enables a small sized dog or horse to stride proportionally further than the larger sized one, and also gives the greater nimbleness to repeat that stride. It is the reverse of this by which we so seldom see an unusually large dog or horse to possess superior speed, or if he does possess it, he seldom maintains it for a long course or race. The larger the animal, the more disadvantage is experienced by a defect in any one attribute for the support of his weight; that disadvantage is increased in a great degree by defects in more attributes than one, which upon the whole confirms the old adage, that, in point of size, " the medium way is best."

I may here add an instance, illustrative of two questions, namely, disadvantage from too great a size with a defect in shape; and secondly, the advantage from a suitable cross in shape. Hasper, before briefly alluded to, page 71, as being five feet seven inches long, and weighing 70lb., has *not run successfully*, though he takes an immense stride, and runs with great velocity; his defect in shape is in that most important point, the junction of his loin with the fore part of the back, and not well ribbed outwards in his last two or three ribs, added to which, he is remarkably deep chested, which increases the weight of his fore quarters; as this point in his back is, in fact, most in request to carry when projecting out his fore feet, it is not likely that he will maintain a long course equally with a dog of a middle size. When eight or nine months old this defect was not so apparent as afterwards, and I thought that he was the most promising puppy I ever saw; but when eighteen or twenty months old, that defect was very apparent, and his owner will probably recollect my remarking it to him, and recommending him not to take him to the Louth meeting, as so large a dog, particularly with that defect, and so young, was not well calculated to run the severe courses over the Withcall Hills. This defect in the back is since much improved, but no improvement has taken place in his last two or three ribs. He was put to the sister of Hecuba; Hecuba, for so good a bitch, was the shortest on her back of any I have noticed; her sister is shorter if either, but by no means so speedy and good in her running; she, however, is very robust in her shape, and in the point alluded to, the junction of loin with the back, she is remarkably strong, and, as may be deemed, has a redundancy in that part which is deficient in Hasper; taking their relative shapes altogether, it was what I should deem a *judicious* cross, be the selection whose it may. Those two which I have seen of the produce, are good in their shapes, fast and good runners; being bred and reared at the Queen's Head Inn, Ashby-de-la-Zouch, they are named after the characters in Sir Walter Scott's novel of Ivanhoe; the dog is called Ivanhoe, and the bitch Rebecca, and are equal and open to enter "the lists of Ashby" with any of the numerous choice you can select from the kennel of Hasper's owner.

Now here is another instance, proving the difference between good and bad rearing; between many greyhounds being reared together, with a deficiency of exercise and sameness of food, as has before been remarked upon, and only few reared at a house where they take their own exercise all day long, and have also a change of diet; these two, reared most of their time at an inn, had also a plentiful portion most days of that, to dogs, most essential article, bone; their constitutions and courage were inferior to no greyhounds whatever, and all their limbs and muscular parts were fully and perfectly developed. One of them, Rebecca, from the goodness of her running against those of Mr. Hassall's own rearing, was taken in lieu of one of the latter to Louth and Sudbury meetings, and ran in the name of Harriet Wilson; and Ivanhoe, the following season, ran in the name of Hourglass. They will be again alluded to, when we come to consider the subject of breeding-in-and-in.

But to return to that shape which gives greatest length of stride; it is not merely the height of the animal with the length of body and quarters; it is not the length from rump to shoulder, united with the entire length of leg from his top down to his feet; those parts which give the greatest length of stride, united with the best action in a horse, for instance, are from the knee of the fore leg to the elbow, from the elbow to the shoulder point, from thence to the hip and rump, and down to the lower part of the cambril joint in the hind leg; the latter giving the best power of getting the hind feet the furthest forward;[1] and the length from the elbow to the shoulder point, with the blade bone inclining well backwards, giving greater facility of moving and power of projecting the fore feet furthest forward; length and strength of back enable him better to lay himself out for that purpose, and to recover his position quickly to repeat his stride. The length from the shoulder point to the elbow, together with the blade bone sloping well backwards, is of much importance, as there is room for more accumulation of muscle at the lower part of the shoulder; the bone from the point to the elbow acting as a sort of *lever crank*, assisted by the contraction and relaxation of the muscles, in projecting the fore feet forward, and after that, in drawing forward the body; the longer that lever is, the greater power it has alternately over the parts at each end of it. The shorter and stronger they are below the knee and cambril joint, the more power and better action they are found to possess. With the exception of the dog having no knee, the length in these parts applies equally the same to his length of stride as to the horse. If a comparative admeasurement were made of these parts with one horse fifteen hands and another sixteen hands high, all other attributes being the same, that horse having the greatest proportion of length in those parts, would be found to have the greatest speed, in proportion to his height, and that difference in speed would be greater or less, according to the difference in the proportion of length in those parts; witness Mr. Houldsworth's Vanish, a mere pony in comparison to his competitors, with 13 stone 2lb. on his back, running second for the cup at Heaton Park, 1832, against such first rate horses as Jocko and others. I have many a time, when two dogs have been put together in the slips, and have been waiting, on some account or other, before proceeding to the course, examined their relative shapes with my eye, and particularly the length of body and their comparative height, and although the result of the course has varied in some few cases, yet it has generally proved in favour of length of body, for when one dog is longer than the other, and of the same height, he has generally shown *most* speed; and I have one instance in particular in my recollection while writing this, where we waited some time, and both dogs stood still exactly together, as much so, as if they had been set together for that purpose, and were exactly of the same length from shoulder point to hip and rump, but one stood full an inch higher than the other; and from my own previously formed opinion, I expected to see the lowest win, because it showed that he was the longest in the back in proportion to the length of legs, and so the event proved, for he beat the other most decidedly from one end of the course to the other,--nor is this all; I have frequently seen, when a dog and a bitch have been put down together, that the difference in their relative length of body bears no comparison to the difference in their height, the bitch being *longer* in proportion to the *height* than the dog. There are nevertheless some, both dogs and bitches, *too* short on their legs, who though they are tolerably long on their bodies, cannot race *very* fast; but where they are short on the legs and bodies too, they are *very slow*, in *every* instance that I have seen.

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[1] If you notice two horses walking together, of about equal size, one longer from the cambril to the fetlock than the other, you will generally see that which is shortest in that part put his hind feet furthest forward.

Good, firm, strong, and wide haunches are very essential to a greyhound running well, but I once saw a dog win a cup in an entry of sixteen very good greyhounds, and he was the narrowest across his haunches of any greyhound I ever saw, either dog or bitch; that, however, is only an exception to a general rule, as next to being strong in the back, is that of being wide, that is, thick, or wide across both haunches, but firm; greyhounds should also be well furnished at the stifle, and the thigh bone wide, as it gives space for a greater accumulation of muscle upwards and downwards, and they should have a good length of the thigh part of the hind legs, to have length of muscle. The fore legs are also necessary to be very good; well set on at the shoulder; not out elbowed, as such are not only clumsy, but are also easily liable to become stiff or lame; their legs bony and straight, and well *set on the feet*, which, all writers agree, should be round and cat-like; I have, however, seen very fast greyhounds, where the feet themselves have been good, their legs good also, yet turned their toes out; no one would think of breeding from such, as where there is a natural deformity, that deformity or defect will generally increase in the progeny. There is, in the fore legs of greyhounds, a difference which I have not seen noticed by any of the writers on the Cynegeticus, but yet of considerable importance, both as to strength and indicative of high breed and good rearing; where there is not good rearing the dog will not be perfect, nor good to breed from, but of this more hereafter.—There are many greyhounds with good bony straight fore legs, yet deficient in muscular substance in the arm or upper part of the fore leg; such cannot be so strong, or endure a course so long as when well furnished in that part. I once saw a dog with his body clothes on, and I was 50 or 100 yards distant from him at the time, brought by the servant of a gentleman whom I knew, to be ready for the next turn to be put into the slips to run for a cup, and expected, from what I had previously heard, that he was quite a first rater; but though his fore legs were tolerably well for bone, also straight, yet there appeared, even at that distance, such an evident deficiency of muscular substance in the arm, that I instantly condemned him as having no chance to win, though having his body clothes on I could see only his legs, head, and neck, and a sorry figure indeed he cut in the course. Now it so happened that the club were short of one to make up the number of sixteen dogs, and this gentleman nominated a dog for an absent member, and, as a matter of course, wishing his own dog to win the cup, he *did not enter one better* than the one he entered for himself, but on the contrary it would have puzzled a counsellor to *have found one worse* than the one he entered for his friend. I knew nothing of this circumstance at the time, and drew my own conclusion of his unlikeliness to win, from the evident deficiency of muscle in his arm, and from nothing else. I have often noticed dogs deficient of muscle in the arm; though some are speedy, they are not stout, and have other signs of bad breeding. As far as that particular deficiency being an indication of inferior breed, we have only to compare the comparative substance of the arm of a thorough bred horse with that of a half bred horse, in proportion to their several sizes of bone below the knee. It is the disposition of fine blood to give fine muscular development where it is most required, and that of a finer and firmer texture than coarser blood affords. The fore legs of a greyhound should taper downwards; in the fore quarters the principal support and spring is in the muscles of the arms and shoulders; in the hind quarters it is in the muscles of the back and the haunches.

Connected with the fore legs and arm, some further remarks on the shoulders are required; as before observed, they should not be straitened and confined, but loose and at liberty, and correspondingly so in the chine, to allow of turning with greater facility; but when Arrian recommends them "standing apart," if he means that the tips of the blade bone should stand wide apart, I think him quite wrong; the more open they are in the bosom and lower part of their shoulders the better, as that indicates a wide roomy chest, admitting free expansion and more play for the lungs; if the tip of the blade bones be wide asunder, which must be owing either to the chest being narrow downwards, as the blade bones lie according to the shape of the chest, or the chest must progressively widen downwards, which if wide asunder at the tip, would make them, on the whole, much too wide in the front for speed. All speedy animals are narrow in the fore part of their bodies upwards, and wider in the hind part where the principal propelling power lies. The frame of a hare, when stripped of her skin, presents a shape very similar to that of a greyhound. The blade bones should incline inwards towards each other, as they rise upwards; and many very fleet and good ones, I have observed, have a slight curve inwards towards the tip; the more the blade bones incline backwards to the chine, the greater facility they possess of getting their fore legs forward, projecting them further out to take a longer and quicker stride. The strength of the animal is not lessened by the chest being more narrow progressively upwards, as that is compensated by the length or depth of rib; and where they are narrow in that part, there is a corresponding narrowness in the chine, which allows the blade bones to fall back by the side of it, when stretching their fore legs forward. The length from the shoulder point to the elbow is generally much greater in blood horses than in cart horses, which also assists their length of stride, as before seen; they are also generally longer in the arm and thigh, and shorter in proportion below the knee and cambril, than cart horses.

Nature has provided all animals destined for great speed with these facilities of action, by not only furnishing these peculiarities and adaptation of shape which enable them with greater ease to move their limbs, but it also furnishes a greatness of quantity and fineness of quality of blood, by which their lungs are not obstructed by its congestion, and a corresponding capacity of vent for the purpose of exhaling and inhaling the air in its passage to and from those respiring organs; the thrapple in speedy animals is found wider than in those of slower ones, and, generally speaking, longer also, as their necks are longer; hence the neck of a greyhound being long, is an indication of fine blood; the thrapple being wide admits a greater volume of air, and being long, admits its being sent out with greater force, and consequently quicker; as a long gun will carry shot to a greater distance than a short one. The neck being long also enables them the better to seize their destined game; their shoulders being properly formed, and at the same time at liberty, the chine also, enables them more easily to get their heads low in running to seize their game, and also aids them in taking the small meuses, with their heads, as it were, between their fore-legs. Without this facility of shape they run high, they cannot lay themselves out properly; they may have speed for a short time by main strength of muscular or propelling power, but they soon tire; in short, they must do so from the want of this necessary facility of action.

All the indications of breed, speed, and shape herein specified for the sire, are alike applicable to the dam; but the breeder will do well to remember the advice of old Gervase, "as near as you can make choice of that bitch which is most large and deep chested, for from thence springeth both strength and wind."

I will close this Chapter, with an anecdote of that celebrated courser, that excellent judge of greyhounds in every thing appertaining to the breeding, rearing, and general management of them, both in the kennel and the field, as well as most excellent and highly respected gentleman, the late Mr. Mundy; and which anecdote, as it applies to breeding, will be appropriate in this place, and acceptable to the reader.

Amongst his other pursuits he was a strenuous supporter of the agricultural interests of the country, and a connoisseur of different breeds of cattle, and, of course, engaged in that line of breeding himself. An intimate friend of his, who had a very superior breed of cows of the long horned sort, who was also an amateur of the long dogs, and possessed very good ones, and was in the habit of sending bitches to be put to Mr. Mundy's dogs, thought proper to refuse compliance with a request from Mr. Mundy to have two cows, which he sent, put to a certain favourite bull; his friend returned the cows with a polite note of excuse, stating that his breed of cattle being of a very peculiar and more than usual valuable sort, he wished to keep it entirely to himself. The poor cows were, therefore, sent lowing away to the tune of "Oh! dear, what can the matter be?" Mr. Mundy put the letter by, without making any remark upon it. Some time after, came, from the same friend, two greyhound bitches, with a request that they might be put to his dog Wonder. He then looked out the letter received back with the cows, and sent the bitches back with a *verbatim copy* of it, with the exception of greyhounds being substituted for cows, which had to trot home to a similar tune the cows did. On their next meeting, his friend inquired why he sent the bitches home unwarded? Nay! says Mr. Mundy, why did you send my cows home unbulled? Oh! says the other, that is quite a different matter; my cows, you know, are of that particular sort that I wish to keep the breed to myself. That may be, rejoins Mr. Mundy, but I happen to think quite as highly of my breed of greyhounds, as you can think of your breed of horned cattle.

BREEDING IN-AND-IN.

ON breeding in-and-in, that is, from nearness of consanguinity, I have in vain consulted various philosophical and physiological authorities for a sound theory on the subject; and in practice the advocates for its utility and inutility adduce evidence so conflicting and contradictory, in such a variety of results pro and con, as to render the subject inscrutable, to a determinate conclusion, in the mind of man. One person objects to inbreeding entirely because he finds a disadvantage from it in some few instances; another approves of it altogether because he sees some instances without any apparent disadvantage; and as they approve or disapprove of it in any one species of animals, so they do in every species alike. This, I apprehend, will be found to be the common error in judging of the utility or inutility of breeding in-and-in; and that it is more prejudicial in one species than in another, and in some no disadvantage whatever is derived from it; in others a disadvantage in one respect, and an advantage in other respects, in the same species; in others wholly prejudicial, especially in their constitutional health and strength of both mental and bodily powers, as is the case with the human species.

The theory of it is necessarily mixed up with considerations of the intention and dispensation of divine Providence in the creation of the world, and the inscrutability of his ways. We are all from one parent stock; the human species from one father and mother, and the brute in like manner; male and female created he them, each of their several kinds. The argument drawn from the consanguineous conjunction of the sexes in the infancy of the world, is the argument of mere necessity, and applies only to that period when it was necessary to increase and multiply for peopling the face of the earth, and the animals for man to subjugate for his own use. Such also, it is fair to infer, was his dispensation in allowing the patriarchs of old to live to a great age, which in later times is not permitted, and seems to have been intended for those patriarchs to convey to posterity the knowledge of God's ordinances for instruction to mankind, and to disseminate that knowledge amongst them till the earth was sufficiently peopled to convey that instruction forward; this being no longer necessary, the lives of men in later times have become of shorter duration. We have scriptural commandments laying restrictions upon inter-marriages with certain near relatives, of those of his creatures whom he has endowed with reasoning faculties, a sense of shame, and a knowledge of his laws. This commandment was given to Moses, (see xviiith and xxth chapter of Leviticus) who, according to Isaacson's Chronological Tables of Events since the Creation, was born 2373 years after that creation, and lived 120 years, which is after the time of those who lived to so great an age; Eber seems to have been the last of those; he lived to the age of 464 years, and died about 200 years before Moses was born; after which I do not find any that lived to the age of 200. Isaac was 180 years old when he died; so that this commandment was given after the earth was peopled in different parts, which, in the wisdom of Providence, we may suppose, was deemed unnecessary, and consequently, by his order, sinful for such close consanguineous conjunctions to take place. It is worthy of remark that these commandments were made so pertinent to the time when the life of man ceased to be of such very long duration: it is also worthy of remark, that the *most select* of his people at the latter part of the period *previous* to this alteration in carrying on future generations took place, were born of parents very nearly related to each other, and were themselves married to near relations, all marrying those which were afterwards expressly interdicted from inter-marrying. Abraham married Sarah his half sister, being daughter of his own father, but not of his mother, Genesis xx. 12. Isaac married two sisters, own cousins to him, chap. xxix. 28. Moses and Aaron were born of nephew and aunt. Amram marrying Jochebed, sister of Amram's father, Exodus vi. 20.

How far this can be supposed to apply to the brute creation is what we can only reason upon from analogy, that great source of reasoning. "If we are to believe Varro," says a sporting anonymous author, "there have been instances even in them of a repugnance to such conjunctions; and though the assertion may have been pushed further than it can be warranted by subsequent experience, it shows the ideas entertained of such consanguineous conjunctions in the days of the Latin author." Varro flourished 50 years before the birth of Christ.

Ere we go further with the theory on the subject, let us examine the arguments and instances adduced by practical men for and against the practice of in-breeding, in which a few out of the many may be selected to suffice for the whole. First, is a letter from Mr. Drake, of Norfolk, an advocate for in-breeding. "My father," says he, "commenced coursing forty years back; at that time Mr. Crow was in full force; they met at Swaffham, and, after several trials, agreed they were well matched; a friendly intercourse took place; they bred from each other's dogs, all relations after the first cross, which was of the very best blood. After Mr. C. died, my father continued with his own strength the in-breeding twenty years without losing bone, size, symmetry, or courage. Selection is the most important object; without that your labours will be lost: for instance, take a dog and bitch, both black; if they are true blood their offspring will be black also, and one very particular point you gain, that is, family likeness; without you have a resemblance, I hold it impossible for any man to make a judicious selection: for instance, take two known good greyhounds, one blue, the other fawn; what colours can you expect their produce to be? Why blue, black, fawn, brindle, red, white, and every colour incidental to greyhounds. Now I ask any man of common reasoning how he is to form a certain and proper selection? look over your friend's kennel we saw the other day, and tell me if you can see any family likeness; are there two of the same colour, sort, size, or any appearance of *one decided breed?* your friend may take it for granted, unless he alter his mode of classification, he will seldom have a good greyhound. To return to the black ones before mentioned, and take it for granted two-thirds of the litter are black; in short it will, it must be so; consequently likeness follows, and there can be no hesitation as to choice but size. Now comes the rub; what do you think of an intercourse between father and daughter, both black; would you expect the colours of the rainbow to predominate in this first litter of in-breeding? I say, no; black would be *blacker*, and blood *more pure;* consequently family likeness must predominate in a strong degree, and make selection more easy. The next step is son and mother, brother and sister, uncle and aunt, grandfather and granddaughter, and so on for at least seven generations; but before half that time, I defy you or all the powers in the universe to produce more than a tythe in one litter of any other colour than black; and why? simply because the blood is rendered *more pure*. Believe me, I am no theorist; it is a system my father pursued at least twenty years, without losing a single requisite; and as a *private* courser, no man in the county of Norfolk stood higher."

I should have thought by this mode of reasoning that the cross with Mr. C's. greyhounds would have caused the breed of his father's greyhounds to degenerate; the proof, however, of their being good ones would have been stronger had he been a *public* courser instead of only standing high as a *private* courser; if they had distinguished themselves in public coursing, where the best dogs in the country are generally selected and brought together, and the courses decided by persons competent to judge of the relative merits of the contending dogs; but in private coursing we know not whether they had good or bad greyhounds to contend against; or how far they actually surpassed their contemporaries, or only were *thought* to have done so, from the partiality so natural to all coursers towards their own, for which some allowance is due, and also for adherence to long pre-conceived opinions.

He adds, "By way of companion to in-breeding, let me draw your attention to the wild beasts of the forest; look at the lion; can man's scrutinizing eye point out any thing different to what he was a hundred years ago? look at the leopard; has he fewer spots, or more, or are they larger or smaller, or in any way unlike what they were since you knew them? Look at all kinds of wild fowl, wild pigeons, sparrows, ducks, geese, &c. &c., and tell me if they are altered one particle? In short, can you point out any thing on earth that has suffered from in-breeding since leaving the ark, but what has been under the control of man?"

Now the latter sentence seems an admission, that animals under the control of man *have suffered* from *in-breeding*, and therefore the question lies with wild animals. Arguments in support of in-breeding have been drawn from hares breeding promiscuously, and yet they beat the greyhounds as much now as they were ever known to do, though the latter are bred according to the best ingenuity of man. Also deer in parks continue their usual size and general appearance. All these I consider as *not conclusive evidence.* With deer, it is well known that at rutting time, the males contend for the mastery, and the master bucks are those favoured by the does; with hares it is similar; five or ten jack hares are seen following one doe, rearing up against each other and fighting; and such is probably the case with other wild animals, so that the breed is carried on by the strongest and most courageous of the males, which of itself is one reason for the breed not degenerating, and, by the way, plainly points out to us the inutility of breeding greyhounds from the worst of litters.

There is another and a very important consideration which militates against wild animals not degenerating, being held as *conclusive evidence* in favour of in-breeding, namely, we know not how far they have any instinctive choice of their mates appertaining to consanguinity; but we do know that Providence has endowed the brute creation with wonderful instinct, without any powers of reasoning; the human species he has endowed with those powers of reasoning, but with less *instinctive knowledge* than brutes. If they possess superior instinctive sagacity over the human species in other cases, they may possess the same, and be guided by it, in shunning or in selecting a consanguineous conjunction in the propagation of their own species.

One instance of the ill effects from in-breeding was plainly seen in a very superior breed of pointers, the property of a very celebrated knight of the trigger in this county; he pursued the system of in-breeding with them from the same motive which I know two different coursers at the present time are doing with their greyhounds, namely, to keep their favourite breed *steady* to their own superior blood; the owner of the pointers, after having pursued the system for several generations, at length acknowledged that he had bred them in-and-in so long that his dogs were all *become fools;* for either with that, or losing the fineness of their noses, they were continually running in upon, and springing their game without making a point.

In the human species, where cousins inter-marry, many instances are known of the offspring being either weakly, spiritless, half idiots, or something the matter with one or more of them. I know a family, and knew the great grandfathers and great grandmothers of the present generation of their descendants; the cousins from the first generation married together, and the children followed their parents' example, till they were as near brother and sister as possible; I have seen them go off one after another, not more than at a middle age, and most of them consumptive, and only one now remains; his children are weakly, and have natural infirmities. Their great grandfathers and great grandmothers were of hale and strong constitutions, and lived to a good old age; so did the grandfathers and grandmothers.

A writer on in-breeding in the Sporting Magazine quotes the late Mr. George Culley, an eminent sheep breeder, and contemporary with Mr. Bakewell, celebrated for producing the new Leicestershire breed of sheep, by crosses from a variety of sorts of that animal. He quotes Mr. Culley's remarks as a proof of no bad effect from in-breeding. But Mr. Culley, whose ability I well knew and highly esteemed, expressly specifies a wide distinction between sheep and dogs; the former from a peculiarity and symmetry of shape, producing an inclination to fatten; and the latter of peculiarly instinctive and sagacious qualities, requiring fire and courage; so that the arguments for one are inapplicable to the other. Extreme fatness some considered to be a species of disease, or approaching to it; the family alluded to, when young, and before becoming consumptive, were very much inclined to fatness; they were not characterized for so much fire and energy as their progenitors; but in that respect more like my friend's in-bred greyhounds, which go to their work "in a cool, deliberate manner."

With respect to Mr. Culley's remark of producing symmetry in shape and a disposition to fatten on the one hand, and the question of losing size on the other, we have instances in two respectable graziers near Derby, who have an excellent breed of long horned cows. Many years ago, a fat cow sent from them to the butcher weighed 12 to 13 score per quarter; but by breeding cows in-and-in, they now seldom weigh above 10 score per quarter, and to use the butchers' phrase, "they are all fat and bone, and no flesh," meaning no *lean* flesh. This account is confirmed to me by one of those graziers,—"they have," he says, "bred them in-and-in a little, and they are finer in their looks, rather less in size, but," he adds, "they *will be fat*, if you give them anything to eat."

As a disposition to fatten is a great object in breeding cows or sheep, it is not improbable that some benefit may be derived by breeding them in-and-in for a few generations, followed by subsequent generations of judicious crossing with the same kind of breed; for whether you regain the same size as before or not, you may produce such cattle, as to fatten a greater number in the same space of time, with the same quantity and quality of food, and thus equal, if not increase, the weight of meat furnished, upon the whole, and at the same expense, to the butcher, and afford more profit; in sheep it would probably give a finer staple of wool.[1]

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[1] Since making this remark, which occurred to me as a natural consequence of in-breeding, if my theory were right; but without knowing whether the wool was finer from it or not, I have been informed by those who have had experience in breeding sheep in-and-in, that it does refine the wool, and to such an evident degree, that the wool buyers give a higher price for it. I also find, that in-breeding in sheep affects the constitution; the lambs are very delicate and difficult to rear; and when reared, they will not bear forcing with good keep as other sheep will; it produces purging

Speed and stoutness are required in the greyhound; a disposition to fatten in the cow or sheep; it may have its beneficial or prejudicial effect in either, according to the nature of the animal, and what we may rationally conclude was the intention of Providence in creating them; for in that intention centres the foundation of all argument upon the subject. It cannot, however, be rationally expected that ultimate benefit will be derived from in-breeding in these animals, without judicious and appropriate selections in the subsequent re-crossing them, whether with the original or a different sort, so as to regenerate the species in those attributes before impaired by it; each department of management ought to be in perfection.

Some arguers on the subject deny, or affect to deny, that in-breeding has any physical effect different from cross-breeding; but that it has a different effect, and widely so, is clear to a demonstration by a multiplicity of instances, and in different ways. We have little or no proof that I am aware of, that any material injury to the constitution is experienced in the brute

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and scouring, and they go on altogether differently from other sheep; like horned cattle, it gives a greater disposition to fatten, but loses size in the animal. The only instance I know of which justifies the supposition that the constitution of horned cattle suffers from in-breeding, is in the wild bulls and cows in Chartley Park, the seat of Earl Ferrers, in Staffordshire. My informant states, that the possessor for the time being, of that Park, is under some obligation specified in the title deeds, to keep up that breed to a certain number; and that he finds it difficult so to do, from the calves being very delicate and difficult to rear. As they range at large in the Park, and are very shy and tenacious of approach, it is probable that they breed in-and-in, and that such in-breeding is the cause of that delicacy of their constitutions. There ought to be a distinction drawn in this respect between these wild bulls and cows confined within the range of one park, their numbers not being great, and consequently breed closer in-and-in, than other wild animals of any description which are in great numbers, and a much wider range. The latter, ranging over a whole country, have a greater change of soil and climate, and probably, in most cases, do not breed very closely in-and-in; consequently the wild bulls and cows in this instance form a better criterion to judge of the effects from in-breeding than wild animals in general.

species, except as before stated to be the case with sheep; but in the human species that injury is the most conspicuous of any that is observed; they often die consumptive. This may arise from a difference in their natural constitution, and that of the brute species; or in the general organization of frame. The family before alluded to, I have known in the most apparent good health, and have afterwards also witnessed the heart-rending distress of the parents at their children and grand-children going off one after another, with no particular cause offering itself for their doing so, but the supposition of its being the consequence of cousins and relations inter-marrying; and such is the opinion of the only survivor of them, as expressed in a conversation I recently had with him on the subject. The only other cause he could imagine which might contribute to that effect, was a cold and the consequent illness of his father a few years before he was married, and which left upon him a trifling husky cough, and spitting up of phlegm the remainder of his life.

In addition to numerous cases of different families which might be instanced, the effect is seen in nearly all the old and most respectable families in an extensive village in Leicestershire, where they were marrying cousins pretty generally thirty or forty years ago, and I am informed by an inhabitant that most of those families are in the way of becoming extinct, from the children being generally consumptive, and having died, without any other reason in particular being assigned, than their parents being relations to each other before marrying.

As an instance in proof of in-breeding not impairing the constitution of animals in the same degree experienced in the human species, I may mention the owner of a pack of harriers, who says he always breeds them in-and-in; and another pack where a bitch has not been sent to any other kennel for a cross during the last fifty years; this produces a uniformity of colour, shape and size, consequently they are more regular in their speed, and are by some hound fanciers thought more handsome as a pack. There may, nevertheless, in these two cases be a degeneracy, in either size, courage, or fineness of nose, which they may not perceive, all degenerating gradually alike, and no other being in the same kennel to compare with them to make the difference obvious. But in a kennel of hounds originally obtained from different places, the inmates are so numerous, that you may breed many years from that kennel without having recourse to very close in-breeding. How near you can go without materially deteriorating any essential attribute is not ascertained, but this point would perhaps be as useful to the question of in-breeding as any part of it. The same writer, who quotes Mr. Culley, mentions a celebrated breeder of game cocks, who possessed a very superior sort, attributing their excellence, as he is *credibly informed*, to his not mixing them with other people's breed. Now this is indefinite and inconclusive, as he does not state how near in consanguinity they were bred, or whether his original breed were all of one hatch, or whether he had different breeds originally by which he could cross them sufficiently without having recourse to other breeders for that purpose.[1]

With respect to game cocks, I need not say I am *credibly informed*, for I have it from the breeder's own lips, who is now living and able to attest it, confirmed by other living witnesses. He has an excellent breed of game fowls, and breeds many cocks for a celebrated knight of the sod, and has incidentally furnished him with some that were in-bred, but they were found not to answer; they were deficient in shape, not straight in their breasts, ill formed, and do not fight with fire or energy, though at the same time they were not what Hudibras would recommend:—

> "He that fights and runs away,
> May live to fight another day."

They do not run away, but will stand slashing to death; yet it is observed and admitted by all I have heard speak of them, that when they do fight, they strike quicker than the other sort.

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[1] Game cocks are seldom bred promiscuously as other barn-door fowls are; the cocks are kept separate, and sent to their respective walks; a number of them may be kept together without any hens amongst them

In-breeding may perhaps be practised with disadvantage to a certain point; what that point is, or what proportion of alien to consanguineous blood is required, so as not to deteriorate any essential attribute which requires redeeming by subsequent cross, it is difficult to say. If two brothers marry wives not previously related to them, the blood in each marriage is alien to each other; if the children from these marriages intermarry, there are equal portions of alien and of consanguineous blood, without any *new addition or change* to renovate the whole animal system, as is done by the experienced farmer, who makes a point of changing the seed if he sow the same kind of grain on the same land; and if the error be an imaginary one, it is still acted on; I should apprehend that the disadvantage for want of this change would be greater, and be sooner perceived in animated than in inanimate bodies; also that in two brothers marrying wives that were sisters to each other, the disadvantage of their children intermarrying would be greater than if the two wives were not related to each other, as, though in both cases, there would be equal portions of alien and of consanguineous blood; yet in the former case there would be only two sorts of blood, while in the latter there would be three sorts, and of course a greater variety.

If we admit that a degeneracy takes place in the offspring from a consanguineous conjunction of the sexes, it must arise from the blood requiring, in nature, a renovation by change from an admixture of alien blood, without which it becomes less efficient, and the body and general system thereby deteriorated; blood is the fountain of life, the agent for the generation of species, and the source of health or sickness; according as it is free from or loaded with impurities, so is the body in a healthy or disordered state, weak or strong; according as it is small in its globules and fine in its texture, so are the bones more solid, the fleshy fibre more fine,

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when chickens or stags, and will rest quiet without fighting; but put a hen amongst them, and battle-royal ensues, until many are killed, unless soon separated. In this way, game cocks are as good a criterion of the effects from in-breeding as other fowls are, or better than they, and as good as any of the different species of animals.

the muscles more firm, possessing more powerful capability, and the coat and general appearance more fine, as in the difference which is seen between the race and the cart horse. The blood is the primary agent which influences and regulates all the organs and parts of the body, and by its circulation searches all the avenues and crevices of the frame, and imparts health and strength, or disease and weakness, according as it is in itself in a healthy or unhealthy state.

It is reasonable to infer, that a change or variety is equally essential to the blood in the re-production of species as variety of aliment, which is found by repeated experiments to be absolutely necessary to the stomach, to impart health, strength, and vigour to the body. It will be seen under the head *training*, and more fully explained there, and has before been mentioned, that Magendie, the highest physiological authority we have, has proved by repeated experiments on dogs, that when confined to a diet of only one substance for a length of time, they suffer great injury from it; even with as much pure wheaten bread, and water to drink in the day as they like, they will die in fifty days.—If you confine them to that diet for forty days, and then give them a change of food, they will eat it voraciously for a few days, yet they will die at the end of fifty days, the same as if their diet had not been changed, and when opened, the same marks of final decay are presented. Various other substances are usually given to dogs, but he has confined them to one; on some they will die at the end of thirty-two days, as in being fed with sugar alone, yet for the first seven or eight days they grow fat with it; others, forty or forty-five days; while these same substances are given simultaneously or successively, they will live and enjoy good health. These are facts demonstrated by actual and repeated experiments; yet I do not find any philosophical cause assigned by him for these effects; yet it must be obvious, from the want of that change or variety so essential in all the relations of life. There are other phenomena in nature which philosophers have hitherto failed in reducing to a satisfactory demonstration; the motion of the body and movement of the limbs are known to be effected by the mechanical agency of the contraction and relaxation of the muscles at the will of the animal under the influence of the brain;

but the mechanical agency subservient to the brain in effecting that contraction and relaxation of the muscles has been hitherto unknown; so have the conception of offspring in the womb, and a variety of others, which will probably remain so to the end of time; and we may say with Hamlet to Horatio,

> "There are more things in heaven and earth, Horatio,
> Than are dreamt of in your philosophy."

Yet the reason for variety of aliment being so essential to the health of the body, in which the blood is so materially concerned, is obviously because *nature requires a change.* It is the same with the mind; variety is acknowledged to be charming; it seems to be also *essential* to the well-being of the body; and why not to the blood in the propagation of species.[1] The propensities peculiar to different species, and their instinctive qualities, are all inherent in the blood of those animals which possess that peculiar instinct and propensity. All our faculties, our powers, our desires, our feelings, our spirits, and every sensation incidental to man or beast, emanate from the blood; these experience a depression by a continued sameness on the one hand, and an increased energy and strength by a change and variety, on the other; deprive the blood of this change or essential variety, and it becomes satiated, and loses the finest portion of its vigour and power, the same as our appetites do with a continued sameness of diet, or our inclinations and spirits with a continued sameness of enjoyment. This inclination in nature for change and variety is beautifully described by Shakespear in the language, on the queen's incontinency, which he puts into the mouth of the ghost in its interview with Hamlet.

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[1] Change of diet is not confined to change from animal to vegetable food; or from flesh to fish or fowl; there is variety of flesh, variety of fish, and variety in each and every sort of food. Thus a sheep, or cow, or horse, which eats grass alone all summer, besides being intended by nature to live on less variety of aliment than man or dog, has yet the necessary variety in the different sorts of grasses in each field, as grasses are not all of a uniform quality, though grown on the same soil; and a removal of cattle from grass on one soil to grass on a different soil, though the pasturage is not more abundant on one than the other, is yet attended with a visible benefit, and the cattle eat the grass in the new pasture more greedily than in the one they have been accustomed to for a length of time. These changes from one pasture to another are frequently made with dairy cows, and a greater quantity and better quality of milk is produced, as is evident from the cheese tub and butter churn. It would benefit a hunter one week to eat of one stack of hay, and the next of an other, equally well got, and apparently equal in quality, but grown on different soils. Oats and beans together are better for a horse than if he were confined to either of them separately for a length of time.

> ——————; "and to decline
> Upon a wretch, whose natural gifts were poor
> To those of mine!
> But virtue, as it never will be mov'd,
> Though lewdness court it in a shape of heaven;
> So lust, though to a radiant angel link'd,
> Will sate itself in a celestial bed,
> And prey on garbage."

This multiplicity of dispositions, in which is a unity of desire for change and variety, are all derivatives from the blood, ordained by nature to require change and new additions in its generating a continuance of those species, which it has not set apart to breed wholly consanguineously, as some sorts of pigeons. The body is fed of the blood, and the blood is fed of the stomach; each remove, generation after generation, receiving new additions the same as the produce from a single grain of corn grown one hundred years ago has undergone by the beneficial change and variation of each soil and clime, when it may return to the same soil whence it originally sprung, and there again will flourish; where, had it continued to be sown in succession year after year, would have degenerated into nothingness.

> "How many things by season season'd are
> To their right praise, and true perfection."—*Shakespear.*

The blood is the source, spring, or fountain head, for putting the whole machine of nature into action, and continuing it in a sound and healthy state; it seems to be the omnipotence and ordination of nature itself to require a renovation by exchange and admixture of new additions of congenial matter of its own nature; inanimate bodies, grain, herbs, vegetables, plants, which grow from the earth, are supported by juices, which in animated bodies are termed blood; these juices to be healthy and luxuriant, require each new growth, to be fostered by a change of soil.

If it be objected that these arguments equally apply to the infancy of the world, when consanguineous conjunctions were sanctioned by the Creator of the world and all things therein, it will yet be allowed that the same divine power that created our first parents by means inscrutable to us, and also created the beasts of the field, the fowls of the air, and the fishes of the sea, male and female; he with them created the blood, the stream of life, the channels through which he ordained that stream to flow, the rivers and brooks, the rivulets and drains, as the veins and arteries may be deemed, in its passage to and from the general receiving and dispensing fountain or circulating medium, the heart; and can it be that he who had the power to build this structure, in every branch so complicate, yet for one uniform and general end, should lack the power to impart the *quality to the stream of life* for its continuance without change, so long as he, in his great wisdom, thought fit; and then, by his ordinance to require a general change? To deny it, must be to deny his power of the original creation of his creatures. They were increased and multiplied to his desire. There may be others of his creatures intended to be continued by consanguineous conjunction, and which are adapted by him for that purpose accordingly; but which leads us short-sighted mortals into dispute on the subject. He then, by his commandment to Moses, 2451 years after the creation, and 800 years after the flood, forbade a continuance of such consanguineous conjunctions in the human species; and punished a disobedience of his ordinances by visiting the sins of the fathers upon the children, and upon their children's children, unto the third and fourth generation, the strongest *earthly* stimulant to obedience, we can possibly possess: on moral considerations it may be that the human species suffer more by in-breeding than the brute, and experience confirms its being more prejudicial in them than in the other.

What proof of holy writ can be stronger of such being his dispensation than the junction of the periods of the termination of such great duration of life in man, with the renewal of God's laws and ordinances to Moses, and his interdiction of consanguineous marriages. It was the epoch of change in the system of carrying on the generations of the earth, as if the system of the blood was arrived at its maturity, and required a genial change to renovate it.

Now I would beg to ask the advocates for in-breeding why this consideration, so far as the philosophy of nature and the blood is concerned, does not apply to the brute creation, as well as to the human species? the necessary increase of the one had kept pace with that of the other, as we may rationally suppose; the blood of that brute, not intended to breed, as some sort of pigeons are, in its renewed generations, would require an admixture with alien blood from that period, the same as in the human species; the children of Israel were thus taught by the commandment of God what in themselves were *unlawful lusts*, and their being endowed with reason, it is not an unwarrantable stretch of imagination to suppose that they would infer the same laws of nature as their guide for that part of the brute creation which was under their immediate control, as for themselves; there is no express distinction made in those commandments between the brute and the human species, as allowing the former unreserved consanguineous conjunction of the sexes; but if the advocates for in-breeding say that there is nothing therein expressed *against* such conjunctions, I conceive that scripture will not bear them out in such assertion.

In these unlawful lusts, it is written *unclean*, in many passages of scripture: for instance, in Leviticus xx. 21. " If a man shall take his brother's wife, it is an *unclean thing*"—and in the 25th verse of the same chapter, it says, " Ye shall therefore put difference between clean beasts and unclean, and between unclean fowls and clean;" unclean beasts may mean unclean from consanguineous conjunction. This I will leave to others to determine.

I am aware that there is an evident distinction between these commandments as regards sinfulness of marriages with certain relations in the human species, and the philosophy of nature appertaining to the consanguineous conjunction of the blood. For instance: cousins may inter-marry without disobedience to those laws; while, so far as regards the blood, what in the brute would be the same as cousins, the consanguinity would be too near, according to the results before noted, and would be detrimental to the health and vigour of the offspring; supposing it to affect the brute in a similar manner to the human species. Again; a man may not marry his brother's wife, nor his own wife's sister; whereas in dogs, there would be no deterioration of the blood in putting one dog to a certain bitch, and for the next litter putting that dog's brother to her; or putting one dog to two bitches that are sisters. The affinity in the former is brother-in-law by marriage; and necessary to be prohibited on moral and religious considerations. Brother-in-law, and brother in blood, are widely different; in the brute, brother-in-law is unknown. Cousins marrying, as before said, produces equal portions of consanguineous and alien blood; half brother and sister, that is, by the same mother but by different fathers, we consider to be nearer relations than cousins; yet the portions of alien to consanguineous blood are equal in them the same as in cousins; an equal portion of one blood to the other, without any fresh admixture. But notwithstanding this distinction between the two, it does not, in the least, militate against these ordinances prohibiting relations inter-marrying, being in strict application to the consanguineous conjunction of the sexes in the brute species, and the necessity for them in the infancy of the world, and the non-necessity for them afterwards, as appertaining to the blood; they were necessary at first; they were not necessary, but detrimental, afterwards; He who had the power of creation, had the power of adapting its duration to his own purposes.

Whatever doubt may remain of the blood requiring a renovation by alien admixture in later ages, different from what it did in the infancy of the world, that doubt cannot be set in equal balance against the positive and certain evidence in all the faculties and powers of life and health, that *nature requires a change;* and such powers being regulated by the blood, it follows, as a rational conclusion, that the blood also requires a change in the reproduction of species; always excepting those animals which give positive proof of their being intended by Providence to breed consanguineously.

The decline in the duration of life in man, which commenced a few hundred years previous to this interdiction against relations inter-marrying, strengthens this position; and it must also be remembered that the longer the duration of life in each generation during those early ages, the fewer generations there would be in that space of time, say 2000 years, than in the same space of time since then, when the duration of life was shorter.

Mr. Pope has somewhere said, that "whatever is, is right;" so in the philosophy of nature we may say, "whatever is, is intended:" or to speak more fully, whatever we find to be the effect of any definite cause, may rationally be supposed to be intended by the Creator.

Since writing the above, I find myself borne out in my assumption, by a few lines from a very respectable and eminent physician, to whom I had shown the preceding pages on this subject of in-breeding; and I only regret his not consenting to the weight of his name being added to what he has so kindly written.

"In the breeding of dogs," says he, "as well as other animals, much diversity of opinion has prevailed respecting the advantages and disadvantages to be derived from crossing; and, on the contrary, from breeding from the same blood, or in-and-in as it is called. The nature of the subject is such, and so many difficulties are attendant upon it, that it is impossible to expect the truth will ever be so fully demonstrated, as to place the question beyond the reach of cavil and dispute. For my own part, I have but little doubt that the judicious breeder, if he desire to propagate animals having certain properties which may best suit his views and purposes, will select those males and females which possess such properties in the most eminent degree, without regarding the nearness or distance of consanguinity.

"By this means he will have just grounds for expecting that the offspring will inherit the properties of the parents; and moreover it is highly probable that such qualities will be, in some degree more or less, heightened and refined in each succeeding generation; and thus, by judicious selection and good management, a higher standard of excellence will be made attainable. But if this notion be correct, and experience will bear me out, I feel confident in asserting that it is, it will follow, as a necessary consequence, that the system of breeding in-and-in will be *beneficial to a certain extent*, and *become prejudicial beyond it.* Perfection in an animal depends upon a combination of qualities; and while the measures you adopt may be augmenting and improving one desired property, and pushing it to the right point, another may be carried too far, and refined beyond the degree sought, so as to lead to deterioration; therefore if, after breeding from the same blood through a succession of generations, deficiency of some attribute be perceptible, it then becomes requisite to correct it by a judicious cross; and in my opinion it is only under these circumstances that a change of blood is ever requisite, supposing the breed in other respects to be of the first order."

Now this is perfectly analagous to the human species from the creation, or from the flood, after which the earth was fresh peopled, and during the old patriarchs, to the interdiction against consanguineous marriages, and may be analagous to the brute species, as I am not aware of any difference in the duration of the lives of the brute species between those ages and the present times, being recorded; yet as the human species, in those times, lived to a greater age than at the present time, we may rationally conclude that the brute species did the same. Therefore, the above theory of "in-breeding being beneficial to a certain extent, and become prejudicial beyond it," is confirmed by the history and experience of the world since its creation.

This theory is also applicable to breeding from male and female that are not of, what may be termed, an established breed, but of two distinct sorts of the same species of animal, as from a male of the greyhound sort, and a female of the bull dog, or any other sort of dog; or from a thorough blood horse and a mare of a coarser or heavy draught kind. And this I should be inclined to think was the writer's intention, when he says, that if "he desire to propagate animals having certain propensities which may best suit his views and purposes, he will select those males and females which possess such properties in the most eminent degree, without regarding the nearness or distance of consanguinity." I should be the more inclined to infer that such was his meaning, because, where the breed has been long established, that is, for many generations, beginning, as from the creation, to breed in-and-in, that point after which in-breeding may become prejudicial, has been already arrived at.

Pigeons will afford us some very useful instruction on this subject, and give ample proof, had we not sufficient analogical proof in different sorts of animals, that the effect from in-breeding is different in some sorts of animals to what it is in others; and that the intention of Providence in the creation of them was not the same, in that respect, in every species of animal; by which we may rationally conclude, that the original composition of the blood was in different proportions of each, or of some parts of the elementary matter composing it.

According to a treatise on pigeons by Daniel Girton, Esq., of the county of Bucks, revised and improved by Mr. W. Thompson, "the pigeon lays two eggs, which produces young ones of different sexes. Their breeding frequently, or but seldom, depends on their being well or ill fed, both in quantity and quality of food. If well fed, some sorts will breed once a month; so rapid is the fertility of this bird in its domestic state, however incredible it may appear, that, from a single pair, 14760 may be produced in the space of four years." It also appears, that in some sorts their constantly breeding in-and-in does not effect any change in size or appearance, while in other sorts it effects a very material change. That sort called the English Power, if bred in-and-in, the *breed will degenerate and be worth nothing;* while breeding the Tumbler pigeon in-and-in would only diminish its size. The varieties produced by pairing male and female of different sorts, are both numerous and beautiful. Though the constancy of the Turtle-dove is proverbial, the dove-house pigeon is not so faithful; two males are often seen quarrelling for one mistress; and when the female encourages the freedom of a new gallant, her old companion shows visible marks of his displeasure, quits her company, and never approaches except to chastise her. Many instances have been known, when two males, being dissatisfied with their respective mates, have thought fit to make an exchange, and have lived in peace and friendship with the new objects of their choice.

The Carrier and Tumbler pigeon will not pair together. Some other sorts, where a cock and a hen are hatched together in a nest, will fly about when fledged, and mix with other pigeons, but when pairing time comes, will pair with none others but those with which they were hatched, brother and sister for perpetuity; others, if they want them to be crossed with a different sort, have to undergo a species of forced courtship, by being kept apart from their own mates, and placed very near their new or intended mates, in separate boxes for a few days, to induce a growing acquaintance and familiarity, and then put together in the same box, before they can induce them to pair together.

Thus we see that there exists a difference in birds with respect to breeding in-and-in, according to their natural and instinctive propensities, as well as a different effect from it in them as in different sorts of animals; and as in pigeons, it is evidently instinctive; it shows that the intention of Providence (the pivot on which all such arguments turn) to be for some sorts to breed in-and-in, and others not to do so; or there may be, and probably are, other sorts admitting of in-breeding or not.

In many animals, and perhaps in all, the difference of climate will effect a very great change in shape and general appearance; this change by climate is much more observable in the brute than in the human species;[1] but it does not, as some authors advance, cause all the varieties of the same species which we have in pigeons, above forty different denominations of which are given in the work alluded to, nor in the different sorts of dogs, horses, &c., though Mr. Girton says, that the stock-dove or wood-pigeon takes its name from being the stock or stem from which all the varieties of pigeons derive their origin; an assertion equally as free from probability as from proof; the same absurdity is advanced, of all the varieties of dogs deriving their origin from the shepherd dog. If it were so, the probability is, that we should now have neither stock-doves nor shepherd dogs entire, as they would have merged into all the several varieties.

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[1] We have a collateral proof of the change which difference of soil and climate will produce, by the uniformity and family likeness produced by long continued occupation of one district by certain breeds. The Mezzaronians, a people inhabiting a fertile district in the deserts of Arabia, unknown to the world in general until disclosed before the inquisition of Bologna, in the year 1712, by a person who had resided 25 years amongst them, and who were originally descended from Mezraim, the grandson of Noah, and had been driven out of Egypt, but afterwards continued together without intercourse with other nations during all that interval; and this person described them as in features and form all so closely resembling

We therefore see every species of variety furnished by a bountiful Providence for the sustenance and support of his creatures; such variety, to a certain extent, being essential, or indeed absolutely necessary to the economy of the animal system; even horses, horned cattle, or sheep which feed on a more apparent sameness of diet the year round, as grass or hay, have a variety of herbage; and the same kind of grasses grown on a variety of

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each other, that no distinction could be made. We have, also, under the authority of Mr. Arthur Young, lecturer to the Board of Agriculture, in London, 1811, a similarity in the different breeds of cattle which had been confined to each of their several districts for a length of time, and were each distinguishable of the breed and district to which they belonged. Mr. Young says,—" Sussex possessed a breed of cattle that had not travelled into Kent, and a race of South-down sheep, to be met with in no other part of the island. Herefordshire, in like manner, boasted a superior breed of cattle, and another of sheep, the Rylands, which had made no great progress. The North Devon breed of cattle was confined to an equally original district; Hampshire and Wiltshire bred a race of sheep which had straggled into rather a larger extent of country, for they were the parents of those which, 60 or 70 years past, were called Hertfords. Dorsetshire possessed a valuable breed for a particular purpose, and was rarely found in any county but its own. Norfolk and Suffolk abounded with a peculiar race, which never travelled beyond their old limits. Suffolk possessed a breed of horses and of cows, which was scarcely heard of in any other county. Durham and a part of Yorkshire formed the theatre of the short-horned breed of cattle, which afterwards travelled into Lincolnshire.

soils. The brewer, when he has many successive brewings from the same quality of malt, finds a change of yeast beneficial, or indeed indispensable towards a proper fermentation of his liquor; this I can speak to as a fact, from several years' actual experience and close observation of the effect. There are many other cases which might be cited that particularly appertain to a fresh production; even the advocates for in-breeding are aware of *some* change being necessary; what they lose from want of change by alien blood, they endeavour to gain by putting together male and female of different ages; the same system is pursued with greyhounds as with fighting cocks; father is put to daughter, son to mother, grandfather to grand-daughter, grandson to grandmother, keeping a change or variety in one shape or another, appearing as though change or variety constituted the elementary essence in the economy of nature.

We then learn a lesson in the instance of pigeons; some require this change in a greater degree than others; some sorts breed closely consanguineous, we may say for ever, without suffering deterioration, while others suffer materially by it in only a few generations; in them there is evidently an instinctive propensity for it in one sort, and a repugnance to it in others. The effect is similar with different sorts of animals, and the human species; in some the constitutional health is materially injured by it, as in the human species in particular, and also in sheep; while others, as the greyhound, do not appear, by the strong case Mr. Drake makes out, to be affected injuriously in their constitutional health; and why may we not conclude, that the qualities and elementary composition of the blood were different for those purposes at the creation of these different animals? The same creative Power which destined one animal for labour and exertion, requires a degree of that labour before arriving at mature age, fully to develope, enlarge, and strengthen his muscular and bony structure to bring him to perfection, and to enable him to endure that labour; as in the horse, the dog, and even in man himself; while those not destined for labour, as the sheep, the cow, and others, suffer no deterioration by want of labour and exertion; and why, therefore, does not this destined purpose apply to a change of blood being necessary or unnecessary in the re-production of species according to their several purposes?

The human species are endowed with powers of reasoning, but are without those instinctive peculiarities common to the brute, which, in the latter, are remarkably characteristic of their several destined purposes and necessities; these serve as a guide in the exercise of that reason, in the management of that portion of the brute creation which are under our control. It is beautifully said by a writer,—"That in the wondrous organization from which the world derives its existence, human knowledge is the quintessence of creative power, affording the sole means of perfecting that, which in its original state is little more than inert matter; the former seeming to furnish models and materials, from which it is left to man to select whatever is necessary to minister to his wants, or to gratify his wishes; it is also self-evident that we are called upon, from our superior capacities, to regulate that active principle of motion, which is incessantly occupied in multiplying, with more abundance than order, the inexhaustible germs of life and re-production."

Now what, I would ask, is the rational inference from the fore-mentioned numerous premises, in unison as most of them are with each other? Why, that we are the co-operating agents in the regulation of breeding that portion of the brute creation which is under our control. We see the effect from consanguineous conjunctions in a new creation for some generations to be beneficial, as in the human species in the days of the patriarchs of old, and afterwards to be prejudicial. We see the same analagous effect in a sameness of food for a limited time upon the body, and of grain sown upon the same soil, which will flourish and prosper for only a few seasons, as sugar will fatten a dog for a few days, after which, without a change of food, he will die in thirty-two days from the commencement of feeding him with it; and the same land will not produce a good crop of corn without a change of seed. If you cross a fine animal with a coarse one, or a greater with a smaller one of a different species, the produce, when grown to maturity (all subjects of management being the same as in putting animals of the same species together) will be larger, will weigh heavier than the medium weight of sire and dam. If you put male and female together that are of the same kind of blood, yet not closely consanguineous, though you do not gain size or substance, you keep it up to the original standard. But if you breed closely in-and-in, you lose size and substance from a want of change in the seed of male and female, although in some animals, as in the greyhound, you gain in other attributes, as fineness of skin and coat, firmness of muscle and solidity of bone, the consequence of the blood being refined, or more closely united in its elements by its affinity and attraction, and no portion of new matter being generated by the impulse given to nature by its required congenial change.

This operates differently in different kinds of animals; for as Markham justly observes,—" Nature taketh to herself an especial prerogative, what is most pleasant to one is most offensive to another." So is in-breeding prejudicial to one, beneficial to another, and in other sorts it partakes of both effects; beneficial in one attribute and prejudicial in another, according to the circumstances under which they were bred.

" Richardson, Hunter, and others," says the veterinarian, "supposed that a vital principle exists, which incessantly watches and guards over the whole machine; a kind of preserving principle that struggles against all the powers that may tend to interrupt its exercise." We confess that we never could discover any such presiding genius, and we acknowledge no other invisible power that watches over animated machines than their Creator. The hand of a Divine Artist is every where visible; and he who can look through the range of Nature's works, and not admire—he who can admire, and not adore, falls short of what Nature intended him for, and is deficient in the first blessings of an enlightened mind.

" Search undismay'd the dark profound,
Where Nature works in secret; trace the forms
Of atoms, moving with incessant change
Their elemental round; behold the seeds

Of being, and the energy of life.
Kindling the mass with ever active flame;—
Then say if nought in these eternal scenes
Can move thy wonder?"

"If there be any one prevailing substance in the animated machine that deserves the name of vital principle more than another, it is the blood. The tenet of the Mosaic philosophy, that 'in the blood is the life thereof,' must be allowed its full weight in its literal as well as figurative sense:—

'The fountain whence the spirits flow,
The generous stream which waters every part,
And motion, vigour, and warm life conveys,
To every particle that moves or lives.'"

On the subject of the existence of some degree of change or variety in all the relations of Nature, the veterinarian remarks,—"If we for a moment direct our attention to the solid parts of Great Britain, we perceive infinite variety branching out of unity of plan. We see chains of mountains, most of them almost barren, and affording a dreary abode to a few children of necessity; we see corresponding valleys, where Nature pours out her abundance, and man, and all animated beings serenely enjoying the blessings of Providence—extensive plains, where harmless flocks enjoy a placid and sportive existence—barren hills, thick woods, and deep marshes, with rivers and lakes interspersed, where various orders of organized beings fulfil the purpose of creation, and hymn their equal God."

"The temperature of the country is almost as diversified as the soil; and both combined produce a diversity in the forms and constitutions of animals of the same species." Such is the Omnipotence of the Divine Creator of all things.

"Could we with ink the ocean fill;
Was the whole earth of parchment made;
Was every single stick a quill,
And every man a scribe by trade,
To write the praise of God above
Would drain the ocean dry;
Nor could the scroll contain the whole,
Though stretch'd from sky to sky."—*George Brothers.*

This subject, on the necessity for some degree of change, more or less, admits of a further and more satisfactory explanation. In page 110, I stated the insufficiency of proof of Mr. Drake's in-bred greyhounds not having become thereby degenerated, by his stating that "as a private courser, no man in the county of Norfolk stood higher than his father;" it would have been much more conclusive if that proof had been derived from his successful running as a public courser. This defect Mr. Drake has supplied; and which furnishes an hypothesis on which may be founded a basis for a further illustration, and a more perfect development of the active principle of motion which influences the effect from in-breeding, in comparison with that of breeding from a mixture of the same kind of blood, but not consanguineous; and with that of, what I may call a *double cross*, namely, breeding from male and female, both of them already crossed, but not consanguineous, as being both half bred, or what may be termed, putting a half bred horse to a half bred mare; or a mongrel dog to a different sort of a mongrel bitch, being the opposite extreme, or having a contrary tendency to that of in-breeding. And as greyhounds appear not to suffer in constitutional health by in-breeding, they are as proper criterions for the purpose as any other animal we can select, and even more so.

I wrote to Mr. Drake, stating the defective proof alluded to, who having occasionally lent some of his in-bred greyhounds to gentlemen who had run them at the Swaffham and Newmarket coursing meetings, he wrote me a further explanation, accompanied by the return lists, with letters from his friends who had entered them there, and an engraving on wood for the portrait of a bitch, Swift, produced by three generations of close in-breeding, namely, first, father to daughter, next son to mother, and, thirdly, brother to sister, the last conjunction producing, Swift, Spartan, and seven others, which all lived, and proved good runners; but as the artist has evidently not done justice to the bitch, I omit the portrait, as if it were ever so perfect, it might be considered as the bitch being flattered by the artist; the performances are certainly criterions more to be relied upon.

He says, "In 1814, I lent Lord Rivers two stallions, Sector and Sultan, sons of Spartan; they got his lordship many winners, as follow, Rarity, Racer, Radius, Radix, Ravena, Rattlesnake, Rawbones, second for a cup, and Rosemary, winner of a cup; Sultan, as Mr. Down's Alchymist at Swaffham, 1814, beat Mr. Hammond's Skylight, a match; and Sector, as Agrotis, beat Mr. Hammond's Sunflower. In 1819 two puppies, brother and sister, lent to Mr. Gurney, one, Aaron, he entered for the cup at Newmarket, but lost his course by an 'accident extraordinary.' He afterwards beat Mr. Coxe's Jane, a match. And Anna beat Mr. Fox's Duchess, and Mr. Syer's Quick, also Mr. Redhead's Yore, in the name of Mr. Wodehouse's Heretic, at Swaffham. The above are the only greyhounds I ever ran at public meetings."

Now this evidence certainly affords no proof of impaired constitution by in-breeding; or if in any ways impaired, it was so little as to be afterwards restored by subsequent return to good but not consanguineous blood. Of this, in these four dogs, there are different degrees of consanguinity; Sector, by a subsequent letter in answer to a further inquiry, was a decided cross with Spartan; Sultan, out of Simony, half sister to Spartan, that is, half brother and sister; Sampson and Swallow, which Mr. Gurney entered in the names of Aaron and Anna, from a grand daughter of Spartan by Solus, three removes from Spartan. These certainly afford a strong proof that close in-breeding with greyhounds, if judiciously practised, does not deteriorate them; as besides those in Lord Rivers's name, we have among the only greyhounds Mr. Drake has run at public meetings, four which have run seven courses, and lost only one of them, which is evidently good running, to say nothing of the "accident extraordinary." Such accidents serve very well to dwell upon when at a loss for a better subject, or in need of an excuse; but to win six courses out of seven needs no excuse for losing the seventh.

Of the facts stated in the letters sent with the return lists, the one which strikes me as being most worthy of remark, and which I conceive to be *very important*, is contained in a letter from Mr. Gurney; he says, "Your bitch Swallow (Anna) won both her courses by *goodness*, as she was beat *very much* in the beginning of *both* courses." There is a coincidence in this fact, with what her owner says in another letter, which strikes me as very curious and remarkable; on the subject of *fire* in a greyhound, he says, "Fire I detest; where there is much fire, it generally ends in smoke. Give me a dog with plenty of natural mettle, that goes to his work in a cool deliberate manner, and the further he runs, the more that mettle becomes visible." This similarity of remark from *two* different persons on *one* breed of dogs, though not written with the same object by each, will justify a supposition that such was the general style of running noticed by Mr. Drake, and such was he accustomed to see in his in-bred greyhounds, which makes him partial to it, and causes him to disapprove of the more fiery starter, which he considers a *flash in the pan*, and soon ending in smoke; that his in-bred greyhounds have a deficiency of speed, but a superiority of wind, or, as some would deem it, stoutness; that they lose energy by in-breeding, till roused to it by their contest with the hare, when their superior wind enables them to show more fire, or mettle as he terms it, than their adversary at the latter part of the course. Now this is in accordance with the opinion of all coursers whom I have had opportunity of consulting, who have been in the habit of seeing in-bred greyhounds run against those which are not in-bred, namely, that whether they win upon the whole course or not, they distinguish themselves more at the latter part of the course than at the first part of it.

Under these circumstances, and in the absence of all proof to the contrary, I feel bound to consider this superior stoutness to be the effect from a *judicious mode* of in-breeding, of which more hereafter; the first thing necessary appearing to be inquired into, is the philosophical cause of this effect. In order to do which, let us examine the opposite extreme from in-breeding, the practical results of which are manifestly visible to us every day in the produce from double crossing, that is, for instance, from a half bred horse and a half bred mare, and that produce again crossed with another half bred one, no consanguinity being in any of the parents. We see these kind of horses, and I have made many inquiries how they were bred, to be of high stature, long boned, lengthy in their body, loose, or, as some would say, shangling, lumbering, awkward made animals, inactive, and without any symmetry or compactness to give them physical strength, but have labour enough in dragging along their own weight.

Now, as we have before seen, under unquestionable authority, that as the blood is, so will the body be; "they find in the blood, all the principles, all the elements of the organs;" it therefore follows, as a certain consequence, that, as the bodies of these horses are found to be, so is their blood; and with the multiplicity of instances we have of a change in the reproduction, and all other relations of life, being so congenial to nature, giving an impulse to it, which, without mixing two sorts of blood, and only of the same sort, but not closely consanguineous, keeps up the size to the original standard, which close in-breeding loses, so does crossing or mixing two different sorts of blood, constituting an extra degree of this congenial change, give an increase of size above the original standard, to the animal produced. As this is found to be the case with the organs of the body, so have we every right to conclude that this extra degree of change generates an increase of elementary matter in the blood, which gives that increase of size to the body. But, at the same time that we see this increase of size, we also see that such increase is not of a good quality; not compressed, unsubstantial, if I may use the term, not consolidated; no compactness or symmetry of shape, giving strength and consequent activity; we may therefore conclude, the body and blood being admitted to be alike, that this increase of matter generated in the blood, is not fully mixed, united, or concentrated with the original elementary matter, and that such deteriorates the whole mass of matter, rendering the whole body inferior in quality to what it would have been without that extra degree of change; and that, although a certain degree of change is desirable, there may be too much for the purpose intended; as we know, under most circumstances in life, that we may have *too much* of a good thing as well as too little of it.

That there is this want of activity, arising from the softness or unsubstantial matter composing the body, we need only compare them with the largest and heaviest of the old sort of established breed of heavy black cart horses; the largest of them are as nimble as a pony in comparison with those of the double cross sort of unwieldy lumbering horses; their action more free and more true; simply from their compactness of shape, and the elementary composition of their blood being concentrated and unmixed with any other sort of blood, gives a solidity and strength to their parts which their whole heavy bulk does not overpower in the degree which is the case with the double cross sort of horses.

From this it results (and no paradox, as we see in many, I might say, in all things) that there is a certain degree, or certain medium in quantity, quality, and so forth, which is the *best possible* to give the greatest perfection in every attribute jointly; it therefore follows from these premises, that we may have *too much* change or variety in re-production, as well as too little for producing perfection. If we combine with these considerations, the known results from close in-breeding, a greater symmetry, more fineness of shape and general appearance, and loss of size, which is evidently the consequence of a want of change, we may rationally conclude that the generally required or customary change by putting together male and female of the same sort of blood, though not consanguineous, gives an increase of elementary matter, but to a less degree than mixing two sorts of blood; and that this greater degree of increased matter by mixing two sorts of blood is not so powerful, so matured, nor so perfectly concentrated as the less degree of increased matter by only one sort of blood, and that not consanguineous; the latter, though necessary to keep up the size to the original standard, yet, in a small degree, renders the whole volume of blood less fine; and that consequently, with close in-breeding, the blood is without this increase of evanid or immature matter, and the original matter more perfectly concentrated, or as Mr. Drake terms it, more pure, which gives the well known diminution in size, greater fineness of body, and more perfectly symmetrical shape.

It nevertheless, by the same course of argument, follows, that to keep up the size to the original standard of those animals whose composition of blood is not calculated, or which were not intended by Providence to breed in-and-in perpetually, as in some sorts of pigeons, that this congenial change, to a certain degree, from whatever source derived, is absolutely necessary. What degree of change, manner of it, or the source whence derived, is requisite for this purpose, we will inquire, after disposing of the question relative to double crossing, or mixing two sorts of blood, and the means of remedying the prejudicial result from it.

Now, as we find that double crossing gives a great increase of size and substance, but that substance of an inferior or unsubstantial quality, from the increased matter generated in the blood, but from want of its due affinity and consequent attraction of the two sorts to each other, does not unite and sufficiently concentrate itself with the original matter; and as the more generations you cross different sorts of blood together, the less and less concentrated it becomes, and the more awkward shape, with less effective strength and activity the animal possesses from it, we must inquire by what means we are to remedy this defect in subsequent generations more perfectly to concentrate this extra degree of unconcentrated, new generated matter?

It must either be by crossing them with one of each entire sort of blood, as putting the produce, a filly for instance, from a blood horse and cart mare, either to a blood horse or a cart horse stallion, and not putting it to another, like itself, half bred, and no ways consanguineous to each; or else it must be by breeding them in-and-in. The former will require many more generations to effect the desired end than the latter, and consequently a much greater number of years must elapse before you regain your required symmetry of shape; but if the former plan is pursued, it ought to be by putting the female to the blood horse each succeeding generation instead of the cart stallion; for, as the seed of the male is more powerful, and predominates over that of the female, the best blood ought to be on the side of the male; and a contrary system is known and generally allowed to produce inferior stock to the other. But by this system, though requiring longer time, you each generation concentrate more and more the elementary matter of the blood, besides adding finer blood, and in time you have a complete hunter, or a cock-tail racer.

But to remedy the ill effects from double crossing most speedily and effectually, you must adopt the system of close in-breeding, I should say, for as many generations as double crossing has preceded it; this may be done without any of those disadvantages of impaired constitution, or other things which are experienced by breeding in-and-in from an entire and established breed; for where there has been double crossing, that is, of different sorts of blood, nature has had more change than it requires; the body is not properly constituted; the constitution is not established; and breeding in-and-in to a certain point will establish the constitution, and render the body more perfect by concentrating the elementary matter of the blood. The only thing you lose by it, is useless size and useless lumber, to manifestly great gain in every other attribute.

This system of in-breeding should be as Mr. Drake recommends, first putting father to daughter; then son to mother, followed by brother and sister, which will completely and progressively concentrate the elementary matter of the blood, and establish the breed; when established it then requires its usual change in reproduction, and if you push the in-breeding beyond that point, you suffer the same loss in the different attributes, as in general cases, although you may gain in some other quality.

The effects which I have observed, as before mentioned, from cross, or double crossing, different sorts of blood in horses, are confirmed by information I have received from breeders of horned cattle, some of whom have tried themselves, or known others to try every experimental cross with them from the many various sorts there are in the kingdom. If, for instance, they say, you put a long horned and a short horned one together, it will do *very well* for the first cross; but if you continue crossing with other sorts, you get *anything but good ones.* As there is a generally prevailing prejudice against in-breeding with breeders of horned cattle, they never seem to think of any remedy for these results by breeding them in-and-in; yet I am convinced, that if the experiment was fairly tried, much benefit would result, probably a new and better breed of horned cattle be established. For instance, if you endeavour to select suitable shape to cross male and female of the same kind of blood, with a view to have more perfect symmetry in the offspring than in the parents, if that shape really was suitable to each other, there would be every reason to expect more perfect symmetry in the offspring, and probably would prove so. But if you selected precisely the same suitableness of shape in male and female of different sorts of blood, you would not obtain so good symmetry in the offspring as in the former cross; and the further you tried that sort of crossing, be the apparent suitableness however good, the further you must get from symmetry. But if you afterwards breed them closely in-and-in for the same number of generations, you would obtain the symmetry you aimed at in the first instance.

A similar effect is observable in dogs; crossing half bred or mongrel dogs of one sort with those of another sort, you lose all compactness or beauty of shape and distinction of character in their propensities and appearance; greyhounds of the cross breed from a bull dog are often large coarse looking dogs, and with them, close in-breeding would probably prove more beneficial in one with less loss in another attribute, than would be found by close in-breeding in the true breed.

Now, except the few instances before mentioned of in-breeding with horned cattle, which are confined to those of an established, not a cross breed, I have no practical proofs to offer of in-breeding following closely upon the heels of double cross breeding with that description of animal; nor any practical proofs that I can rely upon, or that amount to any definite conclusion, of in-breeding in any way with horses; and having been unsuccessful in obtaining information on the subject generally, from those who are conversant with and partial to philosophical inquiries, who say that they have never considered the subject, and do not see their way clear in it, I have been thrown entirely upon my own reflections, and have drawn my deductions from the before-mentioned premises, and the evidently opposite effect double cross breeding has to that of close in-breeding. This effect, it should be remembered, applies only to those animals which are not destined to breed always closely consanguineous, as some sort of pigeons before-mentioned evidently are, and it is not improbable that there may be other birds or quadrupeds similarly destined, but of which I have no particular proofs.[1]

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[1] It is very curious, or I may say, stupid in myself; having in my younger days been over and over again informed of the system pursued

It therefore follows, under all the circumstances, that certain ends may be obtained by breeding greyhounds in-and-in; and that

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by the late Mr. Bakewell in establishing his Dishley or New Leicestershire breed of sheep, which was so exactly in point to the question before considered, that while I was puzzling my brains for weeks and months for a proper theory on the subject, and considering the results of cross breeding with horses, horned cattle, and dogs, and those of in-breeding with the latter, (for the result of Mr. Drake's in-bred greyhounds running at Swaffham and Newmarket, particularly Swallow, as Mr. Gurney states, "winning both her courses by goodness, as she was very much beat in the beginning of both her courses,") posed me no little, and I began to think that I had overshot my mark with respect to the necessity for a change in re-production; and indeed I had done so in some measure, probably like many others, overlooking that you *may have too much change as well as too little of it*, until I turned to the opposite extreme, double cross breeding, to try if I could not find a key by which to unlock the mystery of close in-breeding; it is, I repeat, very curious that all this time, and for months after I had satisfied my mind, and written the conclusion I had come to, as in the foregoing pages, Mr. Bakewell's system in producing his Dishley or New Leicestershire breed of sheep, never once occurred to my recollection.

The effect resulting from that system, however, forms a very satisfactory confirmation of the correctness of the conclusion I had therein drawn; being from 30 to 40 years since I heard much of it, I cannot recollect all the particulars, and have inquired of all those I thought likely to know them, and they are under the same want of recollection on the subject as myself; but we all agree in the main points, namely, that he crossed different sorts of sheep together, what I term double crossing; some say that he began with a Forest ram to the old Leicestershire ewes; others that he began with a Lincolnshire, but not of the large sort; crossing the produce from these with other sorts, until his flock became, to use the phrase of one of my informants, which corresponds exactly with my own recollection, "the largest and most ugly shaped things that ever were seen;" he afterwards bred them in-and-in, I do not know for how many generations, nor whether he did so upon any philosophical principle, or by way of experiment; the latter seems to be the general opinion, and by doing so he obtained the symmetry, small bone, and disposition to fatten, which he originally aimed at, and established that excellent breed of sheep, the rams of which were hired out at very large premiums, and of course were crossed with the flocks of other people, principally those who already possessed a good breed, and from which are derived the best part of the present breed of sheep in many counties. This those breeders of them, or of other animals, who are altogether averse to it, and those who are altogether in favour of it, are, like

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is the animal whose constitutional health is most impaired by in-breeding of any that I have evidence of; yet, after double crossing them, that constitution, instead of being impaired by in-breeding, is improved, and indeed established by it.

Now, observe another confirmation of the theory before advanced, viz. that in-breeding may be pursued with benefit to a certain point, but will lead to deterioration if pushed beyond it. While many other breeders were crossing Mr. Bakewell's rams with their own alien bred ewes, and obtaining a good breed from them, his nephew, who succeeded him on the Dishley farm, knowing that his uncle had derived benefit from in-breeding, persevered in the same system, that is, in-breeding those already bred in-and-in, until he ruined his flock. Before Mr. Bakewell bred them in-and-in, they had had too much change, and he brought them to a proper point; after that, nature, in its re-production, required its customary degree of change, which, being withheld from it, produced this deterioration in the flock.

Before Mr. Bakewell introduced so many improvements in agriculture, in which he had many difficulties to encounter, and prejudices in others for old ways, to combat, it was generally considered in all animals that large bones were indispensable to denote good breed, and it was many years before he succeeded in convincing them to the contrary. Mr. Arthur Young, in his lecture to the London Board of Agriculture, says, "The principles on which Mr. Bakewell began were, fine forms, small bones, and true disposition to make readily fat, which, indeed, is inseparable from small bones, or rather *fine bones*, and fine forms or true symmetry of parts."

I should be inclined to think that *fine* bones and fine forms, &c. are also inseparable from fine blood, and whether you want an animal for labour or to fatten, fine blood promotes both. A blood horse at rest and well fed will fatten quicker than a heavy cart horse under the same circumstances; while all the exercise or training you can give the latter will not produce such firmness of muscular fibre, and power of action, as is generally produced in training the race or blood horse.

With respect to the cross breeding, Mr. George Culley says, "It may be proper to observe that the Dishley breed of sheep are by no means an original breed, but a selection from all the best kinds of long or combing woolled sheep wherever to be met with. Mr. Bakewell began by selecting from the tale of the Chameleon, "all are right, and all are wrong;" the subject admitting of a diversity of good and bad effects.

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flocks in his neighbourhood, and especially in Lincolnshire, in which he was assisted by Mr. Stow, of Long Broughton, who procured many tups for him; and at that period they had better sheep in Lincolnshire, than perhaps in any other part of the island; but observe, that this was before the Lincolnshire breeders had begun to pursue the longest wool, large bone, and great size."

We here find, that notwithstanding the crossing different sorts together produced "large size and ugly shape," Mr. Bakewell did not cross from those of large size; so that this affords an additional proof that such crossing will increase the size. This proof should be borne in mind.

Mr. Arthur Young says, "The particular merit of the Dishley stock is a matter of very small consequence compared with the just principles which Bakewell disseminated in the many journeys he was always making into the various districts of these islands."

"It is in my opinion, unquestionable, from a multitude of facts within my personal knowledge, that the admirable spirit of inquiry, comparison, and experiment, which for the last fifteen or twenty years made such progress, in every part of the empire, was excited by this extraordinary character, Bakewell; and that there is not at present a breed of any sort of live stock in the island, that does not derive its improvement from the skill, knowledge, and principles which we owe to him, and which would not, in any probability have existed, if Bakewell had not laid the foundation. Nor am I clear that Mr. Culley is guilty of the smallest exaggeration when he declares that Bakewell enabled those who followed his ideas, to produce two pounds of mutton, where only one was produced before."

That this increase of flesh, in comparison to quantity of bone, arises, in some measure, from the blood being refined by in-breeding, is what we may rationally conclude; but that there *was* such increase of flesh, particularly of fat, is unquestionable; I had the curiosity, or by the desire of my father, I have forgotten which, to weigh the bones from a shoulder of mutton which weighed, before being cooked, eighteen pounds and a half, and found the bones to weigh only eight ounces and a half. With respect to the thickness of fat, I will close this note with an anecdote of my father. At the time this breed of sheep was becoming known in the kingdom, but not so generally known as afterwards, my father was in the habit, every three months, of

By successive generations of double cross breeding the limbs are longer, the bones thicker, of a coarser texture, not compressed, the frame more bulky, and, in a manner, distorted in shape, no symmetry or compactness, and consequently less strength and activity. But by in-breeding, whether after double crossing or from an established breed, the whole frame is a degree smaller, the bones more solid, the muscle more firm, and every attribute of a finer texture. The globules of the blood will of course be smaller, consequently offer less obstruction to its circulation, when propelled by gallopping, in passing the multiplicity of nooks and corners in the veins and arteries, and cause less, or possibly no congestion about the lungs, whereby they have freer action; this of itself will give the dog finer and longer wind, and enable him to run longer without distress than if he were not in-bred. Then, if we admit that the constitutional health is not impaired, we shall cease to feel surprise at the in-bred dog defeating his un-in-bred adversary at the latter part of a course, when, in addition to the globules of the blood being smaller, we take the following considerations into account.

By losing size you lose length of stride, and length of muscle; by losing muscular substance, you lose propelling power; by losing both you lose power of speed; hence Mr. Drake's Swallow (Anna) "was very much beat in the beginning of both her courses." Lengthy muscle gives greater propelling power than short muscle, but lengthy muscle will sooner tire than short muscle; then, by losing length, by more solid bone, firmer muscle, more symmetrical

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travelling into Lancashire on business, and at Blackburn he frequently met in company, a butcher of the town; the subject of the Dishley sheep was consequently introduced, and amongst other things my father asserted that they were sometimes fed to six inches thickness of fat. The butcher could not believe it, and declared it to be impossible. In consequence of which my father, on his return home, sent a fore-quarter of Dishley mutton as a present to the landlord of the inn where he generally met the butcher. The next journey he went, which happened to be his last, the butcher was gone out of town; but others, who were often of the same party, informed him, that the butcher said, after seeing the mutton, that when that gentleman came again *he would believe him let him say what the d-v-l he would.*

proportion giving more unity of strength to all the parts, by all these advantages united, you gain considerably more durable power of speed; by losing size and substance, you lose weight; consequently all this accumulation of durable power has a less burthen to carry; they have less of their own weight to carry in running their courses, with more power to carry it, and will consequently be longer before bodily exhaustion brings on distress for wind.

Without claiming any experience myself in the running of in-bred greyhounds, these considerations cause me to give credence to the opinions I have heard from different people who have seen them run, who say that they do distinguish themselves more at the latter part of a course than at the beginning of it; in short it must be so, if their constitutions are not impaired. Here are seven or eight different or distinct causes, which all draw together, and unite in one effect, in one physical force, like so many streams running towards the same point, and uniting their force, make a powerful current, all in favour of durable powers and speed in the animal of refined attributes.

It must, however, be remembered, that these greyhounds were not bred in-and-in promiscuously, as it were, but by a gradual system, until they came to the closest conjunction possible, namely, brother and sister, and that close conjunction was only for one generation; there is a species of variety in this system, except that one generation, similar to what some breeders of fighting cocks pursue, putting a two-year-old bird to one of four-year-old, or three-year-old to one of six-year-old, and so on; in these they put father to daughter, then son to mother, or grandfather to grand-daughter, grandson to grandmother; thus if they lose for want of change of blood, they gain by variety or difference in age. But the benefit, if benefit be allowed to it, is in the gradual concentration of the elementary matter composing the blood; not as some breeders argue, that by putting father to daughter you have, in the offspring, *all the blood* of the sire; the offspring from father and daughter must inherit one-fourth of the blood of the grandam, and therefore cannot be wholly of the blood of the grandsire.

Now if greyhounds were bred from brother and sister successively one generation after another, as some sorts of pigeons are, I should apprehend it would be attended with a different result from this case of Mr. Drake's; and in saying so, I am governed by their losing size by close in-breeding (of which I shall give practical proofs by and by) and those pigeons do not lose size, or suffer alteration by it in any respect. Nevertheless, I am inclined to think that a small degree of change in re-production, whether from a mixture of alien blood, difference of age, change of soil and climate, or other causes, may have its use in preventing deterioration in some degree. After the creation, all descriptions of animals must necessarily have bred in-and-in; and unless a change of climate, change of soil producing variations in the quality and properties of food, and other such variety of circumstances, were sufficient to alienate the properties of the blood, so as, after some generations, to constitute a congenial change, it would follow that each and every description of animal, being all from one parent stock, breed in-and-in at the present day without prejudice to their health or shape. But our own experience proves the contrary to be the case with many of them; it therefore follows, on the other hand, that such change of soil, climate, &c., constitute an alienation in the properties of the blood, sufficient to breed in-and-in, after a certain number of generations, without injury. What number of generations, or even length of time without fresh generations, is required for that purpose it is difficult to say; but we know, that according to the food eaten by the mother when she suckles, so is the quality of the milk she produces for her young; and according to the quality of the food eaten by animals who are fed for our own eating, so is the goodness of their flesh; and we also know that change of soil and climate will alter the shape and general appearance of animals during their own life, and therefore the same variety of circumstances may rationally be concluded to affect the properties of the blood for procreation with those born akin to them. If to this be added one change, or mixture of alien blood, bred under these other changes of soil, climate, &c., it might constitute sufficient alienation to breed in-and-in, without any disadvantage. As for example, suppose two brothers born in any village in this county, but removed when very young, one to the south of England and the other to the north of Scotland; there reared to a proper age, and married wives bred and reared in those respective parts, those wives no relation to each other, their children reared in those different climates, and at a proper age, those children inter-marry, which would be cousins inter-marrying, of which we have abundant evidence, is generally attended by loss of constitutional health, or some other defect, where they are bred and reared in the same village or neighbourhood; but in the case here supposed, if any such injury was at all experienced, I should apprehend that it would not be in near so great a degree.

It is an admitted principle in the economy of the human and animal frame, that there is a perpetual waste of the body, even though at rest and well fed, which waste is replenished by its daily food; that waste may be augmented by severe labour, perspiration, or other causes, and according to those circumstances, and to the quantity and quality of its daily food, it becomes fat or lean, or remains much the same in flesh on its body; this must not be overlooked in the consideration of many important questions relating to the animal, and strictly applies to this subject, as there is a continuity of change in the body constantly going on, so that in the course of time we have not a particle of the same flesh remaining, one part of the old flesh going off after another.

The food eaten undergoes, what physiologists term, animalization; it becomes part of the animal itself; "it undergoes chymification and chylification; the excrementary part is separated from the alimentary part, the latter converted into a fluid called chyle, in which state it is taken up by the absorbents and conveyed to the heart, from whence, by the agency of the blood, it is distributed all over the body."—*Dr. Ferguson.*

Then, according to Buffon, the particles of which this fluid is composed, penetrate into the organs, expand them, and augment their bulk; the surplus of which, after the age of puberty, are directed to the seminal reservoirs for the purposes of procreation. The organic particles, thus conveyed to the seminal reservoirs, have each their portion of blood as a component part. As the flesh produced is according to the quality of the food eaten, and as the quality of that food is in some measure governed by the quality of the soil and climate producing it, and the state of the blood affected by the state of the body, it must be obvious that an animal living to the full age of maturity, breeding, and the offspring reared to maturity under this change of soil and climate, must effect a certain degree of alienation or change which will serve the purposes of procreation with those born near akin to them, which, with their parents, have lived in a different climate, without suffering such a degree of deterioration, as would have been the case had they all lived under the same climate during that period.

Admitting this to be the case, how much greater a change must exist between male and female, though of the same kind, and of the same sort of blood, but with whom there has been no degree of relationship for perhaps one hundred or more generations? And how much greater change still must exist between male and female originally of a different kind, as the blood horse and the heavy draught mare? Therefore admitting, which must be admitted, that a certain degree of change is the best possible, and that you may have too much change as well as too little, it follows that all this variety of circumstances must have an influence on that change which is a governing principle in life and re-production.

What degree of change, within our own control, to put in practice, that will cause the least loss in size, yet keep the blood in its finest state, I will endeavour to give a practical illustration of, in two instances of greyhounds which have recently come under my own personal observation, and which, I submit, will tend much to confirm the argument on the subject of the foregoing pages, and with which I will close my remarks upon it.

I have before said that it makes some difference in the effect from cousins inter-marrying, whether two brothers married wives that were sisters, or were nowise akin; as in one case there would be only two sorts of blood, and in the other three sorts, although the proportion of alien to consanguineous blood is equal, and the same in one case as in the other. This conjunction is without any fresh change, or addition of alien blood. The same is the case with respect to the proportion of each kind of blood, by putting male and female greyhounds together, of which I have a case in point, which are half brother and sister, I allude to four year-old puppies, bred from half brother and sister, that were sold by auction at Mr. Hassall's late sale of greyhounds; of course too young for their goodness in running to be known, but quite sufficient for our purpose, as to the effect from such in-breeding, in point of size.

I do not know for certain, but have reason to think that few, if any of the numerous purchasers of greyhounds who attended the sale, and bid with much spirit, were aware how closely they were in-bred, or knew that they were in-bred at all, therefore were not governed by any prejudice on that score. The puppies were very fine in their shapes and general appearance, but so diminutive for their age, that but few would bid for them; three of them made together £6. 1*s*. 6*d*., the other was bought by Sir George Crewe, Bart. at £5. and was a much finer puppy than the others, yet much smaller than dog puppies generally are at that age; otherwise, his beauty and symmetry would probably have more than doubled the price offered for him. Now such was the spirit of the bidders at this sale, and so different the size of other puppies, without any superiority of shape, breed, &c., that one six months' old puppy sold for £8. nearly £2. more than all the three twelve months' old puppies; three ten months' old puppies made together £21.; two eleven months' old puppies made together £28.; and amongst the older ones whose running was known, thirteen of them made £260. averaging £20. each; and nothing that I am aware of, or that has any probability, prevented these close in-bred puppies from selling equally well with the others, but the diminutiveness of their size. They were out of two different bitches, which were sisters, and by a dog that was out of the dam of these two sisters, but got by a different dog from their sire. Here, I conceive, there can be no dispute as to close in-breeding of greyhounds producing a diminution in size, as they were reared in the same manner, and at the same place, with others not in-bred, which others were all of a good fair size.

The other instance alluded to, is two greyhounds, a dog and a bitch, which are now running their third season, and therefore their speed and stoutness are known; they have twice been mentioned before; running in public in the names of Hourglass and Harriet Wilson, or, as their kennel appellations, Ivanhoe and Rebecca; once mentioned as from their rearing being fit to *enter the lists at Ashby*, against any of the numerous kennel whence they were derived; and the other time as to the suitableness of shape in their sire and dam producing much better greyhounds than sire and dam themselves. Many greyhounds have those advantages of suitableness of cross to produce shape, and also good rearing equally so with these, to perfect that shape and support their constitutions; yet but few, if any, can be found so exceedingly stout as these two, which leaves no room to dispute their extreme stoutness being attributable to in-breeding concentrating the elementary matter of their blood, and producing more solid bone, firmer muscle, and finer wind; while, at the same time, the proportion of alien blood, and the frequency of its mixture with the consanguineous blood, prevented any visible diminution of size, or want of speed; in short, they have both very good speed in the first run up to the hare, and have also extraordinary stoutness. The dog, Hourglass, so called because, hypothetically speaking, he will *run for an hour*, has been accustomed to be put down to run five or more courses in a day, and is calculated to have killed from two hundred to three hundred hares.[1]

Their sire and dam were both descended from Mr. Hassall's Bergami, the dam, sister to Hecuba, being own daughter of Bergami, and the sire, Hasper, being great grandson to him, with a third admixture, Harold, the sire of Hasper being descended from Nelson the sire of Bergami; so that there were three mixtures of consanguineous blood, and six of alien blood, namely, Laura and Handy in the dam of Hasper; Quill, the dam of Hecuba; Fly, the dam of Harold; Negress, the dam of Old Grasper, Harold's sire; all of which I know to be alien to Bergami; and the dam of Grasper's sire, Marquis, by Nelson, whose name I do not know, nor whether alien for certain, but have reason to suppose she was so.

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[1] Harriet Wilson barks, or as some term it, *yaffs*, when running; the puppy before named, as more closely in-bred than she is, barks still more than she does; and I am informed that in-bred greyhounds are very subject to bark while running. How far they are more prone to do so than others, I have not sufficient evidence to render that point conclusive; if they are more prone to it than others, it is a demerit, and presents a phenomenon for which I cannot account; it is out of character with the nature of the breed, which are expected to run silently, and to hear them bark is unpleasant to all admirers of greyhounds and amateurs of the sport.

The proportion of alien to consanguineous blood, which, to be correct, a corresponding scale of figures for each must be observed, and will stand thus:

CONSANGUINEOUS.			ALIEN BLOOD.			
Bergami	1	part	Laura	1	part, produced Hercules.	
Hercules	½	do. of Bergami.	Do.	½	do.	do. Harpalyse.
			Handy	1	do.	
Harpalyse	¼	do. of Bergami,	Handy and Laura	¾	do.	do. Hasper.
			Harold	1	do.	
	—			—		
	1¾			4¼		
			deduct	¼	Harold of Bergami's blood.	
	—			—		
	1¾			4		
Bergami	1	do.	Quill	1	part, produced sister to Hecuba.	
	—			—		
	2¾	parts of consanguineous to ……		5	parts of alien blood, in Hourglass and Harriet Wilson.	
				—		

In this, Harold was the first conjunction of consanguineous blood, which by its affinity to Bergami's blood in Harpalyse, would, it is reasonable to suppose, by its attraction, tend to concentrate the other sorts; then comes sister to Hecuba, with a still greater proportion of Bergami's blood to concentrate it further by its affinity.

As this is my own doctrine entirely, I must submit myself to the censure of the critics; but I trust they will not be content with asserting that I am wrong, and that I have been writing a parcel of nonsense, a very common and convenient expression where they are in want of plain proof to controvert what they disapprove, but that they will show by fair argument, where and how it is wrong.

Hourglass was bought at £22. for a stallion greyhound; of course entering him for a cup is out of the question, as from having run so very much, and so often in a day, he could not be trusted to run fair and not throw his courses away. But the goodness of

Harriet Wilson, in the estimation of Mr. Hassall, will be shown in very few words; HE BOUGHT HER IN AT TWENTY-FIVE POUNDS, notwithstanding his leaving off public coursing, to breed from for his own private coursing; and his high estimation of her goodness was from her running so well, and not from any predilection for in-breeding, or any idea he then entertained of such in-breeding being conducive to stoutness, as will be shown by a short conversation I had with him two days *after* the sale.

Without any previous remarks on in-breeding, and without thinking for a moment, or knowing his particular sentiments on the subject, if any such he had, I requested of him, if he had an opportunity, to beg of Sir George Crewe to take notice of the running of the close in-bred puppy he had bought, whether he did not distinguish himself more in the last half of a course than he did in the first half of it? "Why, do they do so?" he asked in some surprise; "yes," said I, "from all those I have inquired of who are in the habit of seeing in-bred greyhounds run against those not in-bred, they all say that they do; and," added I, "if my theory is right, *they must*, and *they will* do so, if their constitutions are not impaired by it." "Why then," said he, "I should think your theory must be right, for Hourglass and Harriet Wilson, you know, are in-bred, and they are the two stoutest greyhounds *I ever had in my life*, or *ever saw of any other persons*."

Mr. Bates has some puppies coming up by Burgundy out of Bertha, which are closer in-bred than Hourglass and Harriet Wilson, but not so close as the former puppies mentioned; they will afford a further criterion by which to form an opinion on this subject, when they come into public running; and are in the proportion of seven parts of alien to five parts of consanguineous blood, and have two mixtures of Old Grasper's blood with three of alien blood, namely, Hecla; bitch by Hippogriff; and Mr. Davenport's Dotteril. This is in the same degree of relationship as putting uncle to niece; the dam of Bertha being by Old Grasper, which was the sire of Burgundy.

Before closing this chapter, it ought to be observed, that in taking the blood to be the primary and preceding agent before the organs, as being influenced by a congenial change or alienation of one sex from the other, in generating an increase of matter which gives an enlargement of size to the offspring from parents, different to when those parents are more consanguineous to each other. In doing so, I by no means intend to tie myself down to the doctrine as an unquestionable fact, that the blood is the sole and primary agent; there are other questions connected with it in the following and other chapters, and where it is more necessary than in this chapter, to investigate the question in detail, and therefore for the purpose of shortening and simplifying the subject, I take that doctrine more abstractedly than unquestionably as a fact.

The object of this chapter is not to prove any distinction in that respect between the blood and the organs, but to prove a distinction between a congenial change or variety by alienation in the seed, of the two sexes which come in conjunction, producing greater quantity in bodily size or substance, but of inferior quality and solidity, than where there is a want of the congenial alienation by change in one way or another; and farther, what degree of change, and the manner of producing it, is the best possible for producing the best size and the best quality jointly, for the several purposes intended.

There is a certain degree of increased matter generated by both sexes being of the same kind of blood, but not closely consanguineous, which keeps the size generally to the original standard, and of the original quality; there is an additional increase of matter generated by mixing two different sorts of blood in male and female, but of an inferior degree in quality; and the more generations there are of mixing different sorts of blood, the more and more the size is increased, but the matter less and less concentrated, producing a greater inferiority of quality; these are in contradistinction from the effect of breeding in-and-in, or consanguineously.

The disputed question of whether the real generative matter is derived wholly from the blood, or wholly from the organs; or whether it is, as some theorists argue, the breed, or the nature of the breed, or as others argue, from the whole organization of the breed, according as it suits their disputative imaginations, is of small importance to the practical breeder, for whom this treatise is more particularly written, since it is obvious, from a multiplicity of facts, that the blood and the organs, act and operate in the most beautiful and harmonious unison with each other, which mutual co-operation constitutes the nature of the breed, or the general organization of it; therefore, to dispute upon nice points of disquisition, or technicality of phrase, as to one or the other of these attributes being the sole or primary agent in producing these well known effects, is, as Hotspur says, when with Glendower and Mortimer, they were dividing the kingdom between them, before they had secured it, like disposing of the bear's skin before they had secured the bear, is like "cavilling on the ninth part of a hair."

What affects the blood, affects the organs; what affects the organs, affects the blood. It is not the elementary matter of either that is changed in its different proportions, so much as the condition of either which affects the elementary matter of both in unison with each other. By the sexes being of the same sort of blood, but not consanguineous, the organization is the same, supposing the healthiness, age, and other matters are such as neither to impair nor improve the constitution; if they do either, they, in degree, alter the general organization of the animal. If they are of the same sort of blood, or breed, or, as others will have it, from the same organization, but closely consanguineous, they alter the organization in a different shape to the other alteration of it. But if the sexes are of two different sorts of blood, the bodies differently organized (to humour these theorists in their principle of phraseology) to each other, they alter the organization of the offspring, in a different shape to either of the other suppositions, and produce an organization in the offspring different to that of either of its parents.

It is found in the foregoing part of this treatise, and will also be found in the following part, that, although I consider the goodness of the blood absolutely essential to produce good offspring, yet that the blood is dependant on a variety of contingences in producing that offspring in the greatest perfection, and therefore perfectly immaterial to the practical breeder, whether the blood takes the precedency over the organs, or over the organization, in propagating species, or not. The offspring takes its formation primarily from the germ of the seed, according as that seed is perfect or imperfect; and, according as the sexes are alien or consanguineous to each other, or according as they are of the same or different sorts of blood or organization, that seed inherits the source of increase or decrease of size, or of keeping it to its original standard.

The seed is in particles, whether properly termed "organic living particles, or animalcula," is immaterial; but of these particles there is an assemblage in miriads; and while a congenial change or alienation from the seed of one sex to the other, gives a stimulus or impulse to nature, which generates an increase of matter in the germination of them, causing an enlargement of size to the offspring, by expansion of the germ with less concentration of its elementary parts; the want of that alienation by change, gives a greater affinity to each other, by which they are attracted in closer union, and affords a finer and more compact and solid substance, occupying less space, by which the offspring is of less size. This I take to be unquestionable; and therefore of quite secondary importance on the question of alien, or consanguineous breeding, whether those particles are derived wholly from the blood alone, from the organs, or jointly, as the general organization, or nature and constitution of the breed; that organization or constitution is altered or not altered, according to the variety of contingent circumstances which is generally attendant on the reproduction of animals.

Many consider the blood as the undoubted governing principle; these are generally the practical breeders, who are not much conversant with philosophical inquiries, and not those who are conversant with them, but less practical; of the latter many, on the contrary, argue that there is no difference in the composition of the blood of one sort of animal and that of quite a different and distinct sort, and that it is the nature, constitution, or organization of the breed; both of which are, in some measure, wrong.

The question of difference or no difference in the composition of the blood in various sorts of animals, can only be fully and satisfactorily settled by an analysis of the blood of the several sorts; should it prove that no difference exists, I shall *be floored* in some parts of my doctrine, but of this I have no apprehensions, for the reasons stated at pp. 45—59, and should be very glad to have the question decided by being put to a chemical test.

As this sheet is now going to press, I will add another instance of the difference in size and general appearance between close in-bred greyhounds and those not in-bred, which came under my observation only two days ago. Two dog puppies, both out of the same dam, but of two different litters; the in-bred puppy from half brother and sister, about fifteen months old; the other seven or eight months old, leaving seven or eight months' difference in their respective ages: I neither measured nor weighed them, except by the eye; the younger one is quite as high standing a dog as the older one, more robust, and I have no doubt would weigh heavier. The in-bred one is very symmetrical, firm, and handsome; plenty of bone in his legs, according to his general substance, but so remarkably clean and fine in them, in comparison with the other, that had I not known the sire and dam of the other to be well bred, I should have supposed him to be of the large, heavy, cross breed; the difference was, of course, more strikingly obvious from seeing them together; for had there been another with him instead of the in-bred one, which was not in-bred, I probably should not have thought the one not in-bred to be any ways coarse, but a good looking promising puppy.

PROPER AGE FOR BREEDING.

THAT the greyhound is highly worthy of every attention, care, and consideration, to produce him in the highest state of excellence, I need only quote a short passage from Arrian, to show. "In figure, the most high bred are a prodigy of beauty; their eyes, their hair, their colour, and bodily shape throughout. Such brilliancy of gloss is there about the spotiness of the party coloured, and in those of uniform colour, such glistening over the sameness of tint, as to afford a delightful spectacle to an amateur of coursing; of all dogs whatsoever, the most noble and princely, strong, nimble, swift, and valiant. The most high bred greyhounds have a prominent brow, and look proud. Their tread is light, quick stepping on their toes; and they walk sideways, extending their necks like horses curvetting." "Any dog may be good of his kind," says his translator, "but a greyhound alone fleet."

In selecting greyhounds as a criterion by which to judge of the principle to be acted upon in breeding other descriptions of animals, I know not any one point for consideration in which they afford more useful illustration and instruction, than they furnish on the subject of age; whether it is best to breed from them when young, or middle aged, or when they are at that age which is deemed old.

I consider this subject necessary, and the most important to be investigated, of any other subject treated of in this work; and

I deem it so the more, because the practical results, which I shall herein produce, are matters of surprise to many experienced and practical breeders of different kinds of cattle; those results are quite contrary to what they would have anticipated, and surprise has been expressed on many occasions where some of them have been mentioned, yet some of the parties to whom they have been mentioned can immediately recollect instances in confirmation of them, which have come within their own observation.

My attention was first drawn to this subject by Mr. Hassall stating that his three celebrated dogs, Claret, Bergami, and Vengeance, were from a dog and bitch, both of them quite old ones at the time those dogs were bred; it was old Madam's last litter of puppies. This he mentioned at the time as an extraordinary circumstance, and so it then appeared to me; but the mist is dispelled; and I feel confident of showing, that while a middle age may be as good as any, yet where the stamina and constitution are unimpaired, in puppies from quite old parents, there is no comparison in the goodness between them and those bred from parents which are young at the time of breeding them; those bred from middle aged, or even old parents, are better in every respect when arrived at mature age than those bred from young parents; more durable, running good ones a greater number of years; better constitutions, and ultimately breeding better greyhounds.

Mr. Hassall's celebrated dog, Hercules by Bergami, was bred when Bergami was only about one year old; and it is a singular circumstance, that notwithstanding I have numbers of instances, besides the three dogs before mentioned, of other good ones, quite first raters, being bred from old parents, I cannot at present, amongst the numerous inquiries I have made on the subject, find any other instance of a very superior dog being bred from a young parent; there *may* be found other instances, and I doubt not that there are others; but I shall expect to find, if such instances are produced, more especially if both parents were young, that the produce are only good ones while they themselves are young; not that they ran good ones to the age we will say of four or five years, or that they bred any very good ones.

Hercules, though his sire was only about a year old at the time he was bred, his dam was five or six years old, and observe, had never bred before; and although he ran a good one for three or four seasons, he did not live to the age many dogs live; and although he got a few good bitches, which may be attributed chiefly to the goodness of their dams more than to their sire, yet he never got half so good a dog as himself; of the others of the same litter with him, I believe seven or eight, I never saw but one, Hamlet, a fair good dog; as to the rest, doctors differ on the subject; Mr. Hassall is unwilling to admit that they were inferior, but I am informed by a friend of his, who knew them well, that they were, what he termed, *bad ones*.

In the case of horned cattle, there is an absence of all *positive* proof either one way or the other; in all my inquiries I cannot find an instance of a bull being kept from serving cows till he is of full age, or even near full age; bulls are seldom more than two years old when they are put to, what may be termed, *full work* in that way; very often only a year old, and sometimes before that age; many experienced breeders acknowledge that it would be better if they were kept till older before they are used for that purpose, as they seldom continue to get good stock for many years; they may get them good shaped, but not such large fine cattle as before, being evidently themselves wasting, and their constitutions gone, before they are become, what is considered, old.

Cows, unless fed for slaughter, are put to the bull when heifers or even sturks, namely, two or three years old; therefore, while we are without any proof from actual experience of benefit in not breeding from horned cattle until they are of full age, we are also without any proof that such a system would *not* be attended with benefit. But, reasoning from analogical proofs, both in the animal and vegetable tribes, I should confidently expect that very ample benefit would result from a different system, to compensate the breeder for two years of extra store keeping of them, although it is sadly too true, that many farmers and breeders cannot afford to be without a quicker return of their outlay. The benefit which I should confidently anticipate from a bull not being used for serving cows, or very little, if any, until, we will say, four or five years old, and cows till the latter time, would be, in the first year of their milking, a greater quantity and better quality of milk, as would be found in the cheese tub and butter churn; that benefit increased in the following year; and their continuing good milkers for a greater number of succeeding years than is now the general case, and during all the intermediate years, producing better stock. Their offspring kept from breeding till five years old, I should expect the benefit would be still more increased and more evident than from the first generation; and by continuing the same system generation after generation, a more perfect constitution would be established; a better shape, and in some measure, a larger size.

I apprehend that it is the well-know vigour and desire of youth, which leads many to suppose that young animals would produce more vigorous and better offspring than older ones; but it is, as Gervase Markham expresses it, "an erroneous fancy." As this idea appears to have led to a very general mistake upon a most important branch of the breeding system, it may be proper, before proceeding farther, to investigate the process of re-production.

Nature, we all know, does nothing suddenly; all her movements are progressive, but, at the same time, slow; the milk provided by nature for the sustenance of the young after birth, is, as will be seen hereafter, a long time in preparation before it is fit for use, and its preparation commences with the commencement of pregnancy. This is in close analogy with the seminal fluid. Animals have this fluid long before the age of puberty, which fluid Magendie says, "is not properly called semen, and has never yet been analyzed." This fluid, ineffectual in itself for the purposes of procreation without the requisite animalcula, or living organic particles, which are in fact the seed, appears to be previously and progressively prepared by nature, and is the element in which those organic particles are ultimately preserved and conveyed in the conjunction of the sexes.

Buffon, who devotes nearly thirty quarto pages to the history of the various theories entertained by physiologists from the time of Hippocrates, Aristotle, Galen, and others, on the subject of what is the real generative matter, assigns the discovery of animalcules to Leuwenhoeck and Hartsoeker, which was not very long before the time of Buffon himself; he, however, combats the propriety of the name of animalcules being given to them, and denominates them *organic living particles ;* this question is of no importance to my subject, for whether they are more properly termed animalcules or living organic particles, they all agree that they are the identical matter essential to impregnation, and the consequent production of species; more modern physiologists, Magendie, Prevost, Dumas, and others, continue to denominate them as animalcules.

Buffon says, "In youth, the seminal fluid is less copious but more *stimulating.*[1] Its quantity continues to augment till a certain age; because in proportion as we approach that age, the parts of the body become more solid, admit fewer nutritive particles, send back more of them to the common reservoirs, and, of course, augment the quantity of the seminal fluid. Thus, if the external organs have not been used, middle aged men, or even old men, procreate with more ease than young men. This is evidently the case with the vegetable tribes; a tree, the older it is, produces the greater quantity of fruit. Young people, who, by forced irritations, determine an unnatural quantity of this fluid into the reservoirs prepared for its reception, immediately cease to grow, lose their flesh, and at last fall into consumptions. The reason is apparent; they lose by premature and too frequent evacuations, the very substance which nature intended for the nourishment and growth of their bodies."

Mules, which do not breed, have this fluid; so have eunuchs, who, Magendie says, "will perform the act with all the ardour of a perfect man, but which can never turn to any account in procreation." It is this stimulating fluid, which becomes more copious when the body is arrived at its full stature, and at the age that man and animals eat more and oftener, as required by nature to support their frame, than when all their organs and parts are become well furnished and perfect; this fluid then becomes more copious, and with its stimulating properties, aided by any kind of forced excitement, will give desire for sexual intercourse, and the youthfulness, and health common at that age, will give the vigour so generally witnessed. It is by these connecting circumstances that men are led to consider young animals fit, and intended by nature to breed, as they are only following its dictates. This I apprehend to be the principal stumbling-block which causes so many inferior animals being produced, and by which they are injuring what would otherwise be more perfect, the sire and dam, to produce an inferior offspring.

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[1] In youth, the nerves and all other organs are more sensitive, and susceptible of stimulus and excitement, than in after age.

There is, however, a very prevailing notion among breeders, that the seed is entirely derived from the blood; consequently they may dispute Buffon's doctrine on the subject, which renders some further inquiry necessary as to whether the seed is from the blood entirely, or from the organs of the body, wholly or in part. Many suppose that the young in the womb is nourished and fed on the mother's blood. Now it appears that neither the seed, nor the sustenance for the young in the womb are the elementary parts of the blood alone, although each particle which constitutes the seed has its component portion of the blood, and that portion appertaining or allied to those parts of each organ from which that particle is extracted, whether from the head, the arms, legs, or any other part, or whether from the skin, tendon, nerve, or muscular fibre of each or any organ, as each of these is before shown by Magendie, to have its corresponding or allied portion in the elementary matter composing the blood. The blood is the mean, or agency, in conveying the nutritive and other matters to their several destinations; of conveying the nutritive particles in the fluid termed chyle to the heart, and thence distributing them over the different parts of the body; of conveying the nourishment to the young in the womb, which fluid Buffon, in his various dissections, has found to be of a whitish colour in the vessels communicating with the fœtus; and it is the agency of conveying the organic living particles to the seminal reservoirs.

The analysis of the human blood, compared with that of the seminal fluid, very much strengthens Buffon's theory, even were his other reasons insufficiently conclusive. The blood is composed of serum and clot, or coagulum; the clog of fibrin and colouring matter.

The serum of the blood in 1000 parts contains, according to M. Buzzelius—

Water	903 parts
Albumen	80
Lactate of soda and extractive matter	4
Muriate of soda and potass	6
Phosphate of soda	4
Loss	3
	1000

One hundred parts of fibrin of the blood contains—

Carbon	53,360
Oxygen	19,686
Hydrogen	7,020
Azote	19,934
	100,000

One hundred parts of the colouring matter of the blood contains—

Oxide of iron	55,0
Phosphate of lime and phosphate of magnesia	8,5
Pure lime	17,5
Carbonic acid	19,0
	100,0

Professor Vanquelin analyzed the seminal fluid, and found one thousand parts to contain—

Water	900
Animal mucilage	60
Soda	10
Phosphate of lime	30
	1000

We therefore find in the seminal fluid, with the exception of water, those elements which compose the organs, and all the several parts of those organs of the body, in the combined shape of animal mucilage, soda, and phosphate of lime; the latter composing the bones; the former the skin, tendons, nerves, and muscular fibre of the flesh.

In addition to this, Buffon remarks that eunuchs having no organic living particles directed to the seminal reservoirs, have, of course, greater accumulation of nutritive particles taking their seat in the organs of the body, by which those organs are expanded, larger, and more bulky, than in ordinary men; and such they are found to be; they have larger limbs, larger joints, and altogether more bulky than ordinary men. The same may be observed in oxen; they are, generally speaking, much larger than bulls of the same breed.[1] It is also the case with horses, though, for particular reasons, not so strikingly visible; the stallions for covering mares, are forced with food and not worked as geldings are, and are made fat for show, or to hide their defects in shape (for fat is of no benefit to them in serving mares) and they therefore look as large, or larger than geldings;[2] but strip them of their superabundance of fat, especially those which have been put to serving many mares while young, and they are no larger in bulk, nor so strong in their parts, as the geldings of the same breed, although they may be as high or higher in stature. A foal of the heavy draught breed, that is promising for a stallion, is forced with food and grows larger in consequence; but being kept from work by which his organs and parts are not fully strengthened and developed, and being put to cover mares when only three years old, are the principal reasons why the breed is so much degenerated, as all practical breeders acknowledge is the case within the last fifty years. It has been generally noticed as being the case, and has excited much surprise that it should be so; but the two reasons just assigned are the leading causes, though other causes may contribute to it; but these two are all-in-all sufficient to produce the degeneracy. I need not recapitulate the reasons, as those respecting the want of exercise may be found in pages 8 and 18, and following pages, and those respecting breeding when too young, in this chapter.

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[1] In the flesh-meat we eat, we find much more gravy and that of a redder colour, from a leg of mutton of a three sheer sheep, than in that of a one or two sheer sheep; the same by beef; the three year old heifer or ox, may eat more tender than the five or six year old, but is not near so rich to the palate, neither affords so much gravy nor so good. In addition to which, ox beef of five or six years old is generally acknowledged to be of a richer quality, and finer flavour, than cow beef that has bred calves; a still greater difference being allowed to exist between ox beef and bull beef, where the latter has been used in serving cows; which shows that, in the latter case, the flesh has been deprived of its best properties by a portion of its organic particles being diverted to the purposes of procreation; and, in the former case, that it is not of so rich a quality when young and growing, as when nearer mature age. Medical men recommend to their patients inclined to consumption, the flesh of full-grown animals, as beef or mutton, in preference to veal or lamb, as affording them more support.

[2] Buffon says, "Men who are thin, but not emaciated, and those who are plump but not fat, are the most vigorous. Whenever the superabundant nutritive particles begin to form fat, it is always at the expense of the seminal fluid, and other generative powers."

These circumstances tend very clearly to prove that the seminal reservoirs are supplied with the seed for procreation from the organs of the body; the natural result from which is, with the young and growing, that those organs are deprived of a portion of their support by an undue or premature exercise of the generative faculties. Were they not supplied from the organs of the body, why, in the often repeated acts of copulation, do we press, with all our sinews and parts wrapped together, as if we were squeezing the particles into one general reservoir? If the seed were entirely from the blood, there need no such pressure; no such sensation is experienced in the blood distributing the nutritive particles all over the

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By this it is not meant that a horse, when he is used in serving mares in succession, should not be well fed; the contrary is the fact; for, as Buffon justly observes, "To a man in health, an evacuation of this fluid whets the appetite; he soon finds the necessity of repairing the loss by fresh nourishment."

In addition to which the general organization of the horse, and the nature of the food he eats, require frequent feeding.

body; after they have undergone animalization, they are attracted from the blood to the parts for which they have an affinity; many matters in the economy of the animal system are governed by the laws of affinity and attraction; the assemblage, as we have before seen, of these particles to their several parts of the fœtus to which they have an affinity, in the impregnation of the seed of one sex with that of the other; and why not the blood dispose of the seed, were it entirely from the blood, with the same ease, and without pressure, with which it disposes of the nutritive particles, the fluid for the nourishment of the fœtus which it conveys, and other matters in the same manner in which no such sensation is felt?

Then, as the seed is derived from the organs of the body, does it not require that the seed should be perfectly good, that the organs themselves from which it is derived, should be perfect, should be perfectly formed, and fully furnished at all points? After the age of puberty there is some surplus, more or less, according to circumstances, of organic particles, such as they are, transmitted to the seminal reservoirs, and therefore they can procreate. But how long a space of time is required, after the age of puberty, and after an animal is about arrived at his full stature in height, to fill up and perfectly furnish all his organs and parts to strengthen and support that stature? We see by Bergami, that greyhounds are at the age of puberty at one year old; they are also nearly at their full stature at that age; but although they are deemed aged dogs at two years old, they are far from being at what can properly be deemed the age of maturity; it is the same with other animals and with man; therefore a greater length of time elapses between the age of puberty and that of maturity, than between the birth and the age of puberty; during which an improvement in thickness and strength of the organs and parts is visible to the eye.

It does not, however, follow, because improvement in those parts is not so visible after the age of maturity as before it, that no improvement is actually going on in them; it is evident from facts, that further improvement proceeds for a much longer time, where the health continues good, and under plenty of healthy exercise; the parts, although they may not appear to increase in substance or bulk, are becoming more and more solid; more concentrated and perfect; and although vigour and liveliness may be on the decline, the appetite sooner satisfied, less food eaten, and not so often as when growing, consequently less abundance of surplus organic particles transmitted to the seminal reservoirs, by which the animal is not fit for copulation so often; yet what organic particles are transmitted to those reservoirs, are of a perfect quality and more powerful, and with fewer evacuations of them, they have, in time, those particles in sufficient abundance as well as in perfection. It is curiously coincident with these facts, that old bitches go to heat with shorter intervals between them, than young bitches do; a young bitch is generally about twelve months, while quite old ones will often be not more than six months between heats. A dog, when old, cannot serve so many bitches in a given space of time as when young, because his seminal reservoirs require a longer time to replenish their supply of fluid and organic particles; but a bitch has plenty of time to replenish those reservoirs, whether twelve or only six months between each heat; and as the organic particles are more powerful and perfect at the older than at the younger age, that is probably one reason why they have shorter intervals between heats, the heat being a provision of nature to give the proper adaption for procreation to all the generative faculties, exercises this provision when the animal system is supplied with its necessary abundance of generative matter. These considerations, therefore, will sufficiently account for aged animals procreating species more and more perfect as long as the stamina and constitution remain unimpaired, although the animal spirits and vigour may be on the decline; and are amply sufficient to account for the offspring of young parents not having the power and duration of speed, or goodness of constitution, as those bred from middle aged or even old parents.

A fruit tree set where there is not much depth of soil before the roots, in shooting downwards, meets with gravel or other hard strata, which stops the progress of the roots, and causes them to shoot along the surface of that strata, checking the growth of the tree, which begins to bear fruit sooner than it otherwise would have done, does not grow into so large and fine a tree as one set where the soil is deeper; the latter, when it begins to bear fruit, does so in greater abundance than the former, and of finer flavour and larger size; obviously from the vegetating particles in one being directed to the production of fruit sooner than in the other, by which the growth of the trunk and branches are not expanded by them in that degree which the tree is that is a longer time before it bears fruit, and is then capable of bearing a much greater abundance of it.

In London's Cyclopædia of Gardening is the following analogical confirmation of the above. "Mr. Knight has well observed, that in annual fruit bearing plants, such as a melon, if a fruit is allowed to form at a very early period of the life of the plant, as for instance in the axilla of the third leaf, it rarely sets, or arrives at maturity, but falls off after beginning to swell, for want of an accumulation of food for its support; while, if the same plant is not allowed to bear fruit until it has provided a considerable supply of food (sap) as will be the case after the leaves are fully formed, and have been some little time in action, the fruit which then sets swells rapidly, and speedily arrives at the highest degree of perfection of which it is susceptible. In woody trees, also, a similar phenomenon occurs."

We have a great number of inferior horses of all kinds, racers, hunters, hacks, and draught horses; also inferior animals of other sorts; and it may be fairly questioned, whether breeding before full age does not contribute to this inundation of inferior cattle more than any one, or possibly all other causes united. They are not only bad themselves, but breed bad ones generation after generation.

I have before said, that Mr. Hassall's Hercules is the only instance within my knowledge of a very superior greyhound being bred from a young parent; and although his other parent was quite of full age, which many suppose would neutralize the bad effect from the too young parent, and others think is much better than both being full aged ones, yet he was the only very good one of the litter, and eventually never got a dog half so good as himself. Mr. Best's bitch Muslin, which bred many cup and stake winners by his Streamer, as will be more fully seen hereafter, her last litter did not prove so good as her former litters; but I know not whether her last litter was by the same dog as her former ones; and as there are so many contingences connected with breeding, which render it difficult, and sometimes impossible, to affix or settle any specific quota of effect which each of the several contingences contributes towards the ultimate result, this case furnishes no conclusive proof against the utility of breeding from old parents.

We will now take a brief review of some instances on the other side of the question, or as Hamlet would say, " Look on this picture, and on this." Having stated the only instance of a good dog from a young parent, we will look at those bred from old parents, and their performances; first, however, noticing Mr. Best's Streamer and Muslin produce, which both appear by the Studbook to have been at a middle age when the first of their winning produce were bred; with them the blood must have been good, their shapes suitable to each other, and in other respects under a good system of management.

His Minna is the first on the list, which came second for a cup at Louth, in 1824, and which, I have reason to think, was her first season of running; as Streamer won the aged cup at Malton, in 1821, he must have been of full age when Minna was bred; also Muslin, which won a stakes at Malton in 1822, and her sire, Jasper, was a winner in 1817, so that he was at least at full age when Muslin was bred; Sir Charles Kent's Stretcher, the sire of Streamer, was also full aged, being a winner in 1816.

Minna was second for a cup at Louth in 1824, won a stakes at Malton in 1825, and was again brought out in 1829, and won another stakes at Malton, when she must have been near seven years old.

Madge won the Louth cup in 1826, and the by stakes in 1828.

Minikin divided a stakes at Louth in 1826, and won the Louth cup in 1827.

Meteor won a stakes at Louth and another at Malton in 1826.

Modish was second for a stakes at Malton in February, and divided a cup there in November, 1828, with Monarch, her own brother.

Monarch divided the cup as above.

Modesty won a stakes at Malton in February, and was second for another stakes in November, 1828.

Mab was second for a stakes at Malton in 1828.

Mercury won a stakes at Malton in 1828.

Mite won a stakes at Malton in 1828, and was second for the Louth cup in 1829.

The above greyhounds were all by Streamer out of Muslin, but I do not know at how many litters. Streamer and his immediate descendants have won seven cups, two goblets, and twenty sets of sweepstakes, independent of what his grandsons and grand-daughters, and later descendants have won. The importance of judicious selections of sire and dam, and other parts of the management of greyhounds, may be seen by Mr. Best's success in his coursing career for upwards of thirty years; having won no less than twenty-three or twenty-four cups, some of them gold ones, and ten goblets or second for cups, and fifty-seven sets of sweepstakes.

With respect to the three celebrated dogs before-mentioned, Mr. Hassall's Claret, Bergami, and Vengeance, by Mr. Worthington's Nelson, out of the Earl of Chesterfield's Madam, given to him by Mr. Hassall, and these dogs bred when both Nelson and Madam were quite old, the Sporting Magazine for February, 1828, page 258, states "the Madam breed to have won in five years, namely, from 1822 to 1827, in the training of different amateurs, one hundred and eighty-seven courses, including five cups, three goblets, twelve sets of sweepstakes, and divided six more. Amongst other particulars it states, that four puppies by Hercules, of one litter, under four different trainers, all won their first courses for the Louth cup in 1825, and were ultimately only beat by each other, except in one instance, and that by a dog of Mr. Hassall's. Four puppies by Bergami of one litter, won seven matches out of eight at Newmarket in 1826, and the other undecided. Of three puppies by Bergami, of one litter, at Burton-upon-Trent, in 1826, one won the cup, another a stakes, and the other divided another stakes. Six puppies of one litter out of Hurricane, daughter of Madam by Spring, of the Old Snowball blood, won fifteen matches out of sixteen. In 1823, Madam's breed, principally by Bergami, ran eleven courses at Louth, and won them all, including the cup.

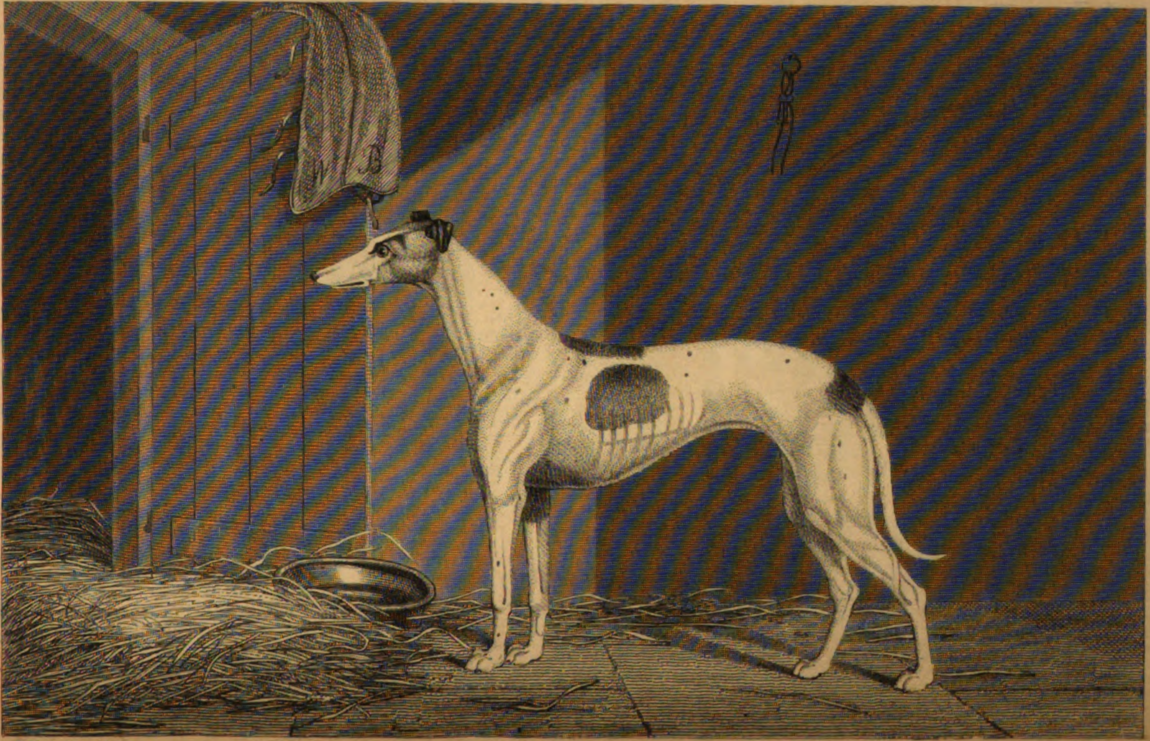
and two sets of sweepstakes. Hercules continued running a winner four seasons, in which he won three cups, one goblet, two sets of sweepstakes, divided another, and won twenty-eight courses, and one undecided, out of thirty-three. Bergami, although he got Hercules when only a year old, was not put to any bitch for two years or more afterwards, was the sire of the winners of the Burton-upon-Trent cups for three successive meetings; the fourth meeting Hecuba by Hercules won it." Since 1827 down to 1834, the descendants of Madam have, under different trainers, won not less than twelve cups and goblets, thirty-four sets of sweepstakes, two hogsheads of claret, besides a main at Louth, between the gentlemen of Derbyshire and Yorkshire, in which the Madam breed were the principal winners for both parties, Mr. Best's Hebe being by Hercules, he having been sold into Yorkshire when nearly seven years old, for fifty guineas. This breed, in the hands of different amateurs, have, in twelve years, been the winners of twenty cups and goblets, and fifty-six sets of sweepstakes, including a few that were not run out, but divided, and two hogsheads of claret. These winnings are known facts; but as the breed has been purchased to go into all parts of the kingdom, where they have run in different names, and often without pedigrees inserted in the return lists, the probability is, that the number of prizes won by this breed of greyhounds much exceeds the foregoing statement. They are, by many, appropriately denominated the Claret breed. The value of the claret; the gold and silver cups, and the sweepstakes won by them in twelve years, cannot fairly be estimated at less than £1500. sterling. Claret and Bergami killed themselves by running, with all the fire imaginable, against a tree or post, when flinging themselves at the hare; Vengeance was twice brought home severely injured in the same way, and several others of the breed have killed themselves in like manner. There is nothing certain known of Madam's pedigree, nor whence derived, only that she came out of an *old bitch*, believed to have been bought many years before by Col. Mellish for fifty guineas.

Claret, I believe, bred no puppies; Vengeance produced several cup and stake winners; but by far the greatest number of the foregoing prizes were won by the descendants of Bergami. The two hogsheads of claret are, however, deserving of a separate mention from the others, as therein Mr. Best has a right to partake of the merit, and to taste the nectar, for winning them. They were both won by Mr. Etwall's Empty, late the Duke of Gordon's Void, bred by Mr. Best, and won him two sets of sweepstakes, and divided a third at Malton, as well as winning her course in the main at Louth, all in the name of Hebe. It is worthy of remark that, being the first hogsheads of claret on record as having been contested for by greyhounds, and one of them open to members of all the coursing clubs in England, there was a selection of the best and choicest greyhounds entered for it, that could be collected together; amongst the rest was Mr. Moreton's Mirth, for which he gave one hundred and sixty-six sovereigns, and which had won a cup and a St. Leger stakes; also Mr. Brown's Bugle, for which he had refused one hundred sovereigns, and which was a cup winner; these two were each beat by Empty; and further, as showing that good ones will distinguish themselves, Mirth came second for one hogshead of claret, and Bugle for the other.

Empty was by Hercules out of Mr. Best's Clari by his Streamer, out of Colonel Elmhurst's Clara, both apparently, as far as can be collected by the stud-book, of full age when Clari was bred, and she of full age when Empty was bred; and Hercules, her sire, more than seven years old at the time.

Mr. Longdon's Grasper, commonly known by the name of Old Derbyshire Grasper, was an exceedingly fast and stout running dog, whose powers endured good for a number of seasons, winning a sweepstakes four successive seasons at the Derbyshire meeting, and one at Swaffham. His dam, Mr. Rowland's Negress, late, Mr. Mundy's, and her dam, Colonel Need's Negress, were both quite old ones when Grasper and his dam were bred; the sire of Grasper, Mr. Worthington's Marquis, I believe was about a middle age, and his grandsire, Mr. Worthington's Nelson, quite old, being about the time when Bergami was bred.

The produce from Grasper, the first year of his serving bitches, about three years old, did not prove very good runners, and were thought small; while those he afterwards produced proved trumps; witness, Mr. Hassall's Harold, bought at thirty-five pounds, and



J. H. Smith. Pinxt.

Bertha.

The Property of Mr W. Bates.

which won a prize every time he ran in public; witness also Mr. Bates's Burgundy, Mr. Lyster's Lapdog, and Mr. Lloyd's Levite, all of one litter, and bred after Grasper had become an old dog, and had been bought at a good price by the Morfe club, and no bitches allowed to be put to him except those belonging to members of that club. Burgundy is now (1835) six years old, and Grasper was a puppy in 1820; so that Grasper must have been about nine years old when Burgundy and the rest were bred; Mr. Lloyd's Hecla, their dam, was out of Mr. Hassall's Hurricane, when old, by his Spring, also full aged; and Hurricane was out of Madam when past a middle age, by Mr. Bulstrode's Major, when the latter was quite an old dog. Hecla was nine or ten years old when she bred those three excellent dogs. Hurricane was one of the litter of six puppies that won fifteen matches out of sixteen.

Lapdog and Levite are each winners of prizes, but I do not know the full particulars of their running account; Burgundy has started twenty-seven times in public, and won twenty-two times, winning two cups, one goblet, two sets of sweepstakes, and dividing a third. Now that he is six years old, he is an honest, fast, and stout running dog; none of his produce, that I am aware of, have yet made their appearance in public, but I know some that are exceedingly promising puppies, and as he has yet had but very few bitches allowed to be put to him, it will be matter of surprise, supposing good bitches of a suitable shape are bred from by him, if his future produce do not prove trumps.

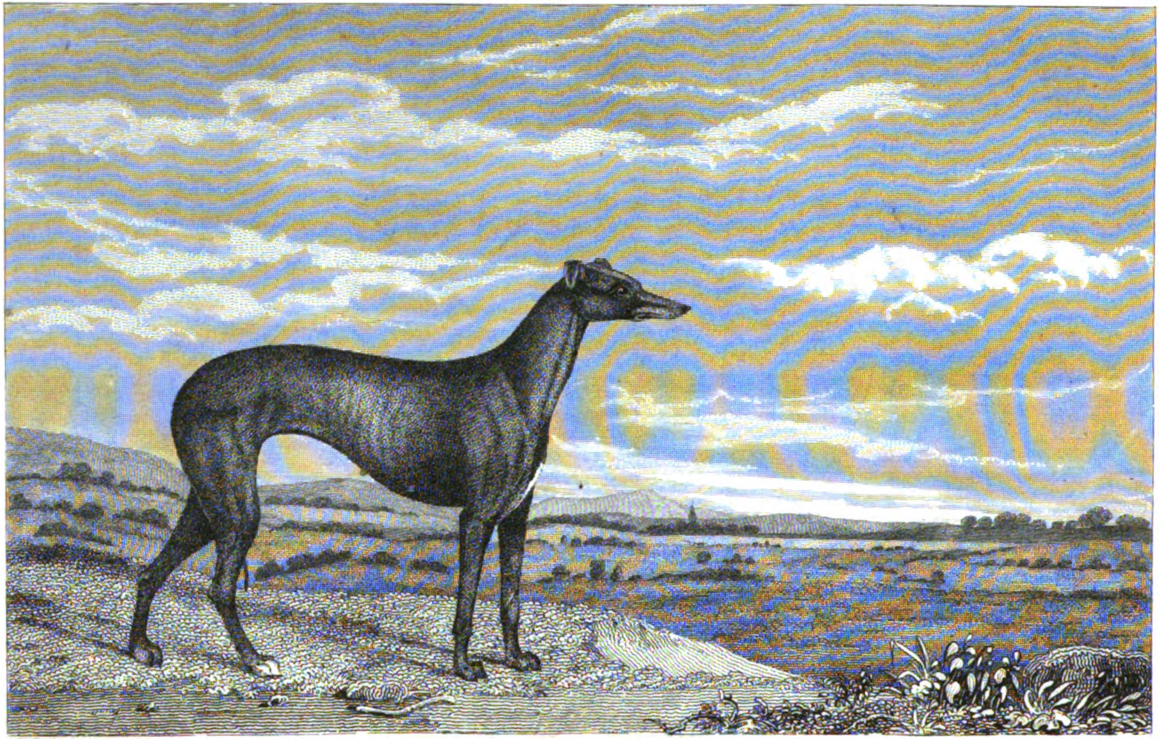
Mr. Bates's Bertha by Mr. Davenport's Dotteril out of Bessy by Grasper, has won three cups and a goblet; and his Barbara, afterwards Mr. Harris's Harkaway, own sister, of the same litter, to Bertha, has won a goblet, a hogshead of port, and two sets of sweepstakes. These two sisters ran first and second for the Derbyshire cup in 1833; Bertha winning the cup, and Harkaway the goblet.

Another instance of good greyhounds being produced from old parents, is Mr. Jones's Jesse, of Shardlow, near Derby; she is about thirteen years old, and it is a good hare that can now get clear away from her gripe, single handed. She is the dam of

Harrington-Hebe, bred when Jesse was ten years old, by Harold, son of Old Grasper; Harrington-Hebe won the Derbyshire puppy cup in 1833, and the Vernon stakes in 1834, and was bought at Mr. Hassall's sale at £30. 10*s*. for the Duke of Gordon, whose property she now is. Jesse is also the dam of many other good ones; her dam, Pass, generally known by the name of the Clifton bitch, a kind of designation indicative of a generally acknowledged good one, which was procured to breed the litter when Jesse was produced, by Mr. Richard Thompson, of Draycott, near Derby, was thirteen years old at the time. Unfortunately, we do not know anything of her pedigree, or the age of her parents when she was bred; but from her having produced many very good and first-rate runners, also being of an excellent constitution, and a good runner herself for so many years, I cannot doubt but that her parents were of a good constitution and a good age when she was bred, and probably *their* parents also. Dandy, the sire of Jesse, was seven or eight years old when Jesse was bred; Rose, his dam, had been in Mr. Hoskins's possession when a runner for a season or two; then given to Captain Chawner, of the Rifle Brigade, who had her with him with the Army of Occupation all the time they were in France; and it was a year or two after that when Dandy was bred; he was by Mr. John Wallis's Old Smoker, of Derby, son of Mr. Mundy's Wonder, when the latter was an old dog.

I may also adduce Mr. Hodgkinson's greyhounds before mentioned, as an additional proof of full aged greyhounds producing good runners with good constitutions and stout; and although I do not know that he was particularly partial to breeding from very old ones, yet I do know that he preferred a full age to a youthful one; and although he is no public courser (otherwise his side-board would probably have displayed a few splendid trophies of gold or silver cups) yet for upwards of thirty successive years, his greyhounds have been allowed, by his numerous friends and competitors, to be inferior to no greyhounds against which they have contended.

A red bitch, Nun, before mentioned, as being bred by this gentleman, and afterwards given to me, which is allowed by all who



J.H.Smith. Pinx.t

Hark! Away.

The Property of [illegible] Harris Esq.r

have run their greyhounds against her to be a very superior bitch, was by a dog about four years old, but out of a bitch seven or eight years old; grandam and grandsire both old ones, and many of her former progenitors quite old when her subsequent ones were bred; none, I believe, less than at a middle age. She is now ten years old or more, and her running, even this season, has created more admiration in those who have witnessed it, than any greyhound she has contended against. She is now the property of Francis Hurt, Esq., of Yeldersley, near Ashbourne.

Another instance I will give, and though last, by no means the least important one, is the renowned Snowball, the property of Major Topham; he was the grandson of Lord Orford's famous bitch Czarina. The Stud Book says, "It is recorded of this bitch, that she won forty-seven matches without ever having been beat, and showed no signs of producing progeny till she was thirteen years old, when she brought forth eight whelps, by Jupiter, that were excellent runners. She was the dam of Claret and young Czarina, belonging to Colonel Thornton, and challenged all Yorkshire. Claret was the sire of Snowball and Major." She, like old Pass, is unknown as to her pedigree, and the age of her parents when they bred her.

We find from the Stud Book, that Snowball and his immediate offspring, exclusive of his later descendants, who still continue to distinguish themselves in public running, have won nineteen cups, goblets, or plate; and that at a time when very few cups were run for in comparison with later years, or the present; the number run for each year continuing yet to increase. Claret, by the Stud Book, appears to have been of a middle age when Snowball was bred; but Phillis, the dam of Snowball, I believe was in Berkshire in her running days, and becoming Major Topham's property after that, was consequently getting old when she bred Snowball. We find Snowball running a winner of cups and plate for four years, from 1798 to 1802. Young Snowball a winner of four cups and plates in one year, 1822. Snowdrop, of the same litter, won five cups and plates, and continued running a winner of them for eight successive years, namely, from 1802 to 1809 inclusive.

Now what is the obvious inference from so many of these greyhounds, the most celebrated of their day, being produced from aged parents, some of which were very old, both sires and dams in several of the cases, at the time of producing them? I do not mean to contend from it, that it is always the best and safest way to breed from very old ones in preference to those of a middle age, or of an age between that and very old; for I should deem the contrary the safest, as although we have these, I may say, positive proofs that very old ones will, if their stamina and constitutions are unimpaired, produce as good offspring as can be produced from parents of any age whatever, yet you cannot always rely on the constitutions of very old ones being unimpaired; but you may rely with greater confidence on those of a middle age, and something more, having their stamina remaining, when you find that they continue good runners at that age.

But in the absence of all proof of young parents producing excellent offspring in any degree proportionate to those of old parents, proves to a satisfactory demonstration that the idea entertained by so many breeders, that young parents will produce the best offspring, because they display more vigour than old ones, is completely "an erroneous fancy;" and that such a system is a very bad one to be acted upon.

These numerous instances of very superior greyhounds being produced from old parents, prove, in my opinion, another and a most important fact; they prove that, to breed from young animals, on the one hand, weakens the bodily powers; while, on the other, to refrain from breeding from them when young, or from frequent evacuations by the generative powers, until age lessens the bodily powers for severe and long continued exertions, husbands the resources of those bodily powers already formed, and improves them by fresh additions from time to time; and not only enables those bodily powers to endure severe and long continued exertions for a longer time, but establishes a better constitution, and enables them ultimately to convey to their offspring, and to their offspring's offspring, greater bodily powers, more stamina, and better constitutions, to endure for a corresponding longer time their own severe and long continued exertions. Nor is the benefit from it confined to the organs of the body alone; the blood partakes of it.

> "The fountain whence the spirits flow;
> The generous stream that waters every part;"

in conveying the nourishment to the organs of the body, and in performing its various functions in contributing to the growth and re-production in a healthy state, it receives its due degree of benefit in return; it does not alter its elementary composition, but its state of condition is better or worse according to a variety of circumstances; so is its condition better or worse, weaker or stronger, according to the healthiness and strength, or unhealthiness and weakness of the organs and parts with which it is intimately connected.

I cannot here refrain from repeating Buffon's remarks, or I might say rhapsody, on contemplating the mechanism of the animal frame. "What a variety of springs, of powers, and of mechanical movements, is included in that small portion of matter of which the body of an animal is composed! What a number of relations, what harmony, what correspondence among the different parts! How many combinations, arrangements, causes, effects, and principles, all conspiring to accomplish the same design! But however admirable this work may appear, the greatest miracle is not exhibited in the individual. It is in the successive renovation, and in the continued duration of the species, that nature assumes an aspect altogether inconceivable and astonishing." The instances before-mentioned, proving the difference between re-production from young animals and from those whose ages are matured and perfected, are in strict unison with his general theory on the subject, and prove him to have taken a very correct view of this complicated and most abstruse piece of mechanism, yet all its intricacies uniting in the most beautiful and harmonious manner.

The organs and parts of the body being perfected in unison with the blood and other fluids, are then well constituted; they form the basis and foundation of a good and perfect constitution. This constitution, nevertheless, requires care and proper management in its further progress of re-production and subsequent growth of the offspring to maturity, in which we will proceed to inquire into the proper manner of accomplishing it, after having disposed of some other matters connected with the preceding remarks.

It then follows, from this beautiful unison and harmony of all the parts of this living machine, that, as the blood is known to possess "all the elements, all the properties of the organs," so does it possess them in the same good or bad state of condition to which those organs themselves are promoted from their first formation, and subsequent state of perfect or imperfect development, by proper or improper food and exercise, to the time of the re-production of their species.

The ancients, however mistaken in some of their notions on physiological matters, were nevertheless aware from experience of the ill effects from breeding from either dogs or bitches when very young. Arrian says, "The seed is weak and evanid; and a puppy bred from a young parent is so injured by it, that you can never afterwards, do what you will, remedy the error." He considers the effect very great from one single warding, as in p. 142, he says, "The dog should not be let loose after a hare until he is recovered from his exhaustion, and invigorated by an interval of at least sixty days' rest, after which there will be no obstacle to his being coursed." His translator adds, "This caution is unnecessary for modern coursers, who rarely use the same hound in the field and kennel for coursing the hare, and supplying the pack with high bred successors. But if the same dog be employed for both purposes, the interval specified for the restoration of his powers is not too long. The Cynosophium, however, suggests a shorter period of thirty days, during which, nutritious food is to be administered, and then a stallion hound may be again taken out for sport."

Modern coursers rarely using the same dog in the field and kennel for the two purposes mentioned, is quite contrary to my experience; as amongst those with whom I am most intimately acquainted, nothing is more common than for them to do so; nor is there a greater error, nor one more commonly committed in their whole system, than this is. Even so far as the bodily exhaustion, which is only temporary, though I admit it to be great for the time, much more so in the dog than in the bitch, although if it take effect, the ultimate injury lies heavier on the bitch than on the dog; yet that temporary exhaustion is a matter too little attended to generally, and by some no attention paid to it whatever. It clearly appears that the ancients considered it of importance, and with them coursing was not so emulative an amusement as with modern coursers; the former followed it for the diversion of witnessing "the contest between the dogs and the hare, and the pleasure of seeing the turns and doubles the creature would make to get away." The latter, in many cases, for contest between dog and dog, disregarding the poor hare, except with those coursers who think no course worth seeing unless there is a hare at the end of it. The modern coursers contend for prizes of great value, and the emulation to win them is very great; therefore if that exhaustion was of consequence when not engaged in so emulative a sport, it must be of more consequence when contending for prizes of so much value, and when each dog has need of the addition of all the powers that can be administered to him, and therefore the depriving him of any of those he already possesses, must be very detrimental to his success in running. The injury, however, from this temporary exhaustion is the least part of the evil attending the use of the same dog for the field and kennel, especially while young; the ultimate and greatest evil has been shown before, and therefore it is needless to *beat that ground* over again; but as all coursers are desirous of having their whelps pupped as early in the spring as they can, in order to have two summers for one winter in rearing them to an age when it is customary to course them, they must, if the bitch goes to heat soon enough for that purpose, put her to the dog during the coursing season, at a time when it is desirous of avoiding even that temporary exhaustion, a circumstance which strengthens the objection against using the same dog for the field and kennel for the purposes mentioned. Nor is this all: it is attended by an intellectual as well as a bodily disadvantage; for, in these cases, an early march of intellect is an acknowledged disadvantage; and although without improper management it will unavoidably come upon greyhounds by age and experience, it will, by coursing them when in a weak or unfit state, from whatever cause, bring that intellect upon them earlier, and by forced marches; as the sooner they are tired, the sooner they find the necessity, and become addicted to wait and save themselves.

Most authors agree, that a similarity and maturity of age of sire and dam is requisite, as a general principle, to breed good whelps. Markham and others, however, admit, that "to breed with a young dogge and an old bitch, *may* bring forth an excellent whelpe;" but, on the contrary, it is contended, that when bred from an old dog and a young bitch, the whelps will never be good ones. On this latter subject I cannot recal to my recollection one solitary instance of a superior greyhound being produced from an old dog and a young bitch, and have made many inquiries without success. Young dogs are very commonly used as stallions, and young bitches are very often bred from, because they sometimes go early to heat, and it is erroneously supposed, by disappointing them, you are acting contrary to the dictates of nature, when, at the same time, that early heat is frequently brought on by excitement from various causes, and especially from being with other bitches, old or young, when those others are at heat.[1] Of this, however, more hereafter.

"You shall observe," says Markham, "to have your dogges and bitches of equal and indifferent ages, as about three or four years old at most; but in case of need, your bitch will endure a great deal longer than your dogge; and to breed from a young dogge and an old bitch may bring forth an excellent whelpe. The Falician says, 'they should be of tried spirit.'"

For every longing dame, select
Some happy paramour; to him alone
In leagues connubial join. Consider well
His lineage; what his fathers did of old,
Chiefs of the Pack, &c.—*Arrian Translated*, p. 140.

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[1] Mr. Drake says, he has noticed all his life, that the best bitches, and of the best breed, are the longest before they go to heat, or before they will take the dog when they are at heat.

Arrian says, "A bitch's age may be considered good for the purpose from the second to the seventh year;" and again, p. 136, "The proper and seasonable time for sexual intercourse is from the completion of the third year. Dogs should be kept from copulation within the age stated."

I, however, know many instances of bitches that have not bred until four, five, or six years old, and have then produced much stronger puppies than younger bitches generally do; for a few instances, I may name first Laura, the dam of Mr. Hassall's Hercules; she was four or five years old before she bred, when she produced Hercules; Handy, the dam of Harpalyse, the latter by Hercules, was five years old before she bred; the celebrated Madam was a good age before she bred; Harpalyse had no puppies till she was four years old, and her puppies by Harold were so strong, that her owner remarked to me that he thought of putting her to a smaller dog on that account.

These facts, and numerous others might be given, if necessary, of those bitches producing stronger and better puppies which do not breed till they are of full age, than of those that breed earlier, are additional proofs to those mentioned in the first part of this volume, of the benefit to the offspring of animals, or of man himself, by the parent having undergone proper exercise and exertion in his bringing up to mature age, more perfectly to develop his muscular and bony structure, as that is undoubtedly one reason, in addition to the maturity of the seed, why aged greyhounds produce more bony, firmer, and better runners than young ones produce. The greater age gives more time for the structure to be more perfectly developed, and the exercise and exertion strengthens the constitution and assists the age; they each assist the other in producing perfection.

The want of maturity in the bitch, when she breeds her first litter, although that litter may not be so strong, does not prove that her subsequent litters should have any want of substance or strength, unless it proves that her own growth is checked by that early breeding, which the facts before-mentioned will warrant our concluding to be the case. Their going to heat before they are of mature age, may, in some cases, be induced by the dictates of nature wholly, without being aided by any particular circumstances of excitement, or other causes; and as we admit nature to be our safest guide, it would follow, as a natural consequence, that their desire to take the dog should be gratified; but these are questionable positions; some do not go on heat so early by a year or two, or even more, as others do; the heat may be induced by other circumstances; as for instance, infectious, if I may use the term, or by excitement from being with other bitches which may, or may not, be of mature age when they go to heat, as smelling at each other may excite them to it; when there are two or more together, if one goes on heat, most of the others, if not all, generally do the same; or it may be generally induced amongst them by excitement from high feeding, or being fed principally on raw flesh, with all its foulness and impurities, but which, nevertheless, is very stimulating and conducive to a feverish temperament, and may produce the heat, which renders the question doubtful of the heat being the pure dictates of nature, and therefore questionable as to putting the bitch puppy to the dog under this variety and uncertainty of circumstances. This doubt is strengthened by the facts before-mentioned of those bitches producing stronger and better puppies which do not breed before a mature age than those bitches do that breed before that period.

While we admit that proper exercise for the growing puppy is essential towards the perfect development of its powers, we must also admit that such exercise and exertion may, and very often is, carried too fàr, to the ultimate injury of the animals' physical powers; in fact, rendering them old and infirm, before arriving at a mature and perfect state of strength in all their attributes. Young horses of all descriptions, when put to full or equal work with those of mature age, suffer irretrievable injury in various ways, whereby the âcme of their speed is gone, lost, and destroyed for ever. To breed from such, even when they are at an age when breeding is desirable, is equally as bad policy, as breeding from an animal when too young, if not worse; their joints and parts are ossified, callous, impaired; and instead of being well constituted, the good constitution required for breeding is gone; the same by the dog, although they are not so subject to this injury as the common hack, stage coach, and other road horses.

Now this principle is equally applicable to the generative faculties; the mere act of copulation is only a temporary exertion, from which they, in time, recover; and if not too frequently repeated by the dog puppy, the ultimate effect is not so injurious, or at least not so perceptible as in the bitch which breeds from that one act of copulation. Her organs of generation continue at work, *at full work,* though she is too young, the same as a bitch that is of full age, during the whole time of gestation, and afterwards in forcing the organs of digestion and nutrition to supply her puppies with milk; thus depriving the bodily frame for three or four months of a great portion of its required support from the food she eats, and tending to prevent the more perfect development of her muscular and bony structure both by food and exercise; this, too, at a time when, had she not been pregnant, that structure would have been receiving its full and final completion of development and power. This must generate an innate weakness, or want of perfection in the organs of generation, as well as of the bodily powers, entirely sufficient to account for the difference observable between puppies bred from a mature aged bitch, *and that not bred when under full age,* and those that had bred when under a full age, and is applicable to all animals.

The organs of generation are those which are the last that are required to be brought into exertion; for, as it cannot be that nature intended an animal to re-produce a perfect species until that animal is itself perfect, and that the exertion of the other organs of the body is required for the perfecting of the animal, and of course for perfecting the organs of generation with the other organs, so must the latter organs be required to be perfected by exercise before the organs of generation are required to be brought into use.

Give the organs of generation full scope, according to inclination, before maturity, they weaken and counteract the growth and perfection of the body; while the body, properly exercised during its growth, and kept from injury by premature sexual intercourse, strengthens and brings to perfection the organs of generation. Most animals, for reasons before assigned, will have sexual intercourse before maturity if you allow them to do so; so will they eat food uncongenial to their age, and many other things improper for them, if left to their own control; but we are the co-operating agents in regulating the order of things in the brute as well as in our own species; and in this, as well as in other cases, the reason with which the Creator—the great Architect—has endowed us, is required to be exercised over the brute; and we ought to remember Shakespear's beautiful remark before given,—

> " How many things by season season'd are
> To their right praise, and true perfection."

If a bitch is put to the dog before she is arrived at her full measure of growth and strength, a double task is imposed upon nature, that of breeding, and at the same time of finishing and completing the perfect development of her general frame in all its attributes; in which case, she must do one or the other of them, if not both, imperfectly. She is put to the *task required of a perfect and full aged animal, before she is herself perfect; and at the same time when she has this double task imposed upon nature.* This must check her growth, and prevent her arriving at such perfection as she otherwise would have arrived at, and therefore affects her subsequent ability for producing such perfection in her offspring as those bitches do that have not experienced this check of their growth. Then this offspring, produced before she is of full age, as they are formed from an assemblage of particles from every organ of the body, both of the male and the female, if either male or female is not perfect, mature, and fully developed in all his organs, how can those organic particles be either so abundant, so perfect, or so powerful, when the organs from which they were derived were themselves in a state of imperfection?

" Most animals," says Buffon, " discover no inclination for sexual intercourse till their growth be nearly finished. Those which have but one season in the year have no organic living particles in their seminal fluid till that time. As bitches have smaller bodies than dogs, the particles have sooner a surplus for the seminal reservoirs, and are at mature age for breeding sooner than dogs are; if a bitch be at mature age in two years, a dog is not so till near three years old. A woman, for the same reason, is at as mature age for breeding at twenty as a man is at thirty years of age; and a small man or woman is at mature age for breeding in fewer years than a large man or woman; according to the size of all animals, from the elephant to the rabbit or mouse, they are a longer or shorter time before they arrive at their full growth; it is the same with the fœtus in the womb; the mother goes with young a longer or shorter time in a corresponding degree to the time required for full growth after birth."

It is a curious circumstance, and worthy of remark, that while the females of the brute species breed to the last year of their natural lives, the females of the human species do not breed much longer than to half the age some of them live. This subject will be again mentioned in another chapter, with respect to the provision of nature to give the proper adaption for procreation to the generative faculties; but we may in this instance perceive the wise dispensation of Providence, though many of His ways are inscrutable to us. The mother of the brute has little or nothing to do with her offspring after having finished suckling them; they are then under the management of man endowed with reason, or left to their instinctive guidance in procuring food and places of rest, and security from danger. But with the human species, the mother's care is far more valuable for some years after they have ceased to suckle their infants, than the father's; and even until the offspring is arrived at a mature age, the mother's care is invaluable to them. This continues in many cases till the time the youngest of, perhaps, a numerous family of children, are grown to man's estate; nor does it end here; their services and attention are directed, with very great benefit, to their grand-children; neither their own children nor their grand-children, at least the younger parts of them, could have this benefit, if the mothers were permitted to breed to the last year of their lives, as is the case generally with the brute species.

The mother has the first duties of forming the infant mind; the first impressions on which, endure the longest in regulating their future dispositions; and it is indispensably necessary to their future conduct through life, that those first impressions, and their succeeding ones, should be such as are conducive to a future good conduct. This question is so ably treated of by many authors, that I need not dilate upon it; I have, in my journey through life, seen numerous instances of children becoming good and respectable men and women when the mother was of that character, though the father was but indifferent; and vice versa, the children becoming very indifferent or vicious characters when men and women, when the father was every thing that was respectable, but the mother unfortunately not so; but as a proof of the necessity for a *good* mother to superintend the tender and expanding intellect of her children, I will here add a very strong instance.

A very numerous family of children, I believe above twenty, the father of whom I knew very well, who was considered by his neighbours a respectable man in his calling, but the mother of them unfortunately had always been connected with people of bad character; the sons and daughters were remarkably fine, handsome men and women; but their vicious propensities were so grounded in them from the impressions given to their minds in infancy, that the greatest part of them suffered the penalty of the law for one description of depredation or another; some of both sexes suffered the extreme penalty of being hanged; others of both sexes were transported; in short it was said of them, in plain terms, and sadly too true, that they were all either rogues or wh—res, or both.

The vicar of the parish in which the parents lived, with the most laudable motive, took the youngest child, a girl of two or three years old, into his own house, thinking, by giving her proper instruction, she might become a respectable woman, and observed, that if he could save *one brand out of the fire,* he should do some good. It was, however, too late; the vicious propensity had already taken root in her mind; not very long after she had become an inmate of the vicar's house, a gentleman there on a visit, left his gold watch on the dressing table in his sleeping room, and when he returned into the room, after an absence of not more than half an hour, the watch was gone; an instant inquiry was made amongst all the servants, but no clue could be obtained of what was become of the watch unless this child had taken it, and she was consequently immediately searched, but no watch was found upon her, and with all the apparent looks of innocence, declared she had no knowledge of it whatever. The vicar, who was also a magistrate, immediately issued a warrant to search the house of her parents, and there the watch was found. We need, therefore, when such long continued care and watchfulness over the offspring of the human species is required by the mother, no longer wonder at, but admire the wisdom of Divine Providence, in appointing the destiny of the female of the human species to be a great length of time after she has ceased to breed, as a necessary difference between her and the females of the brute species which have no care of the offspring after ceasing to nourish them with milk provided by nature for that purpose. It therefore follows, that the brute is intended to breed to the latest part of her life, and consequently that she is adapted to breed good offspring equally so at that period, as at an earlier period of it.

I was observing to a coursing friend of much experience in breeding greyhounds, how necessary it was for them to be well reared to be good ones; at which he puffed, and said, that to be a good dog, he must be born a good one. True, O king! but to be born a good one, he must also be a good one begot; and to be either born or begot a good one, there must be no imperfection in the health and other fit state for procreation in the parents at the time he is begot; the mother properly fed and managed during the interval; and to be ultimately produced a real good one in the field, there must be no defect in the subsequent rearing and training. The first may be compared to the main-spring of a watch; if it have an imperfection, the watch will not go well, however perfect the machinery may be. The second to the machinery; if only one wheel, pinion, or pivot, is clogged or imperfect, it nullifies or depraves all the efforts of ever so good a main-spring, and all the other parts of the machinery, however perfect those other parts may be. It is the same with greyhounds, or indeed with any animal, from the selection of sire and dam, their age and fitness for procreation, and throughout the whole progress of breeding, rearing, kenneling, feeding, exercise, and all the routine of et cæteras, to the time they are slipped at a hare to run the deciding course for a cup; if you omit one essential, you spoil the whole structure. That to be a real good greyhound he must be a good one begot, is shown in practice as well as in theory, and is made manifestly clear, not only by what Arrian dwelt upon so strongly seventeen centuries ago, namely, "that a real good dog is a treasure which falls to the lot of few men to possess, and for which he ought to sacrifice to Diana Venatrix;" but also by what is well known at the present day, that there are very few real good dogs; but that where one is found to be really good, he begets good ones, generally, while inferior dogs, or only tolerably good ones, very rarely beget any superior dogs, though put to good bitches; witness Major Topham's Snowball, Mr. Best's Streamer, and others, compared with many dogs that have good bitches sent to them, but which produce nothing above mediocrity.

That a good age is one great essential towards producing good dogs, is manifest from the before recited instances between the *great number* of good ones produced from full aged parents, compared with the *very few* produced from young parents. Buffon, who purchased many dogs and bitches, rabbits, fowls, &c., for the purpose of investigating the progress of re-production, both in the different stages of the heat in the female before taking the male and afterwards, and during the growth of the fœtus, killing and dissecting one female at one stage of the process, and another each succeeding day of its progress, discovered many curious phenomena which will be useful to the practical breeder. Amongst the rest, in a course of forty-six different experiments by dissection upon rams, bulls, dogs, bitches, cows, ewes, and rabbits, with occasional opportunities upon men and women, young and full aged, assisted by his coadjutors, Needham, Daubenton, Guineau, and Dalibard, and in each dissection, never less than two of them, but generally all five, attending the investigation, he discovered a less perfection for procreation, both with respect to the organic particles, and also the other generative faculties, in the young than in the full aged; and that there was greater imperfection in those still younger than in the others; and a precisely corresponding difference in the early, middle, and later periods of the season for breeding, or for heat in the females. Those experiments relating to the latter subject, as well as to some other parts of it connected with breeding, will be noticed hereafter.

Some breeders of horned cattle, and especially those who have but few to breed from, will put a two-year-old sturk, or three-year old heifer, to the bull; and as the calf at a year old is of a good size, and looks promising, they therefore think that such age is as good to breed at as any other. But there are nevertheless experienced breeders who acknowledge that such calves do not eventually make so good cows, nor breed so good stock, as those bred from full aged cows.

To the males, if put to the females but seldom when young, the bad effect is not perceived; but many breeders inform me, that if a young colt, of the heavy cart kind, for instance, be put to covering mares at three years old, and continue going on regularly covering, he does not grow so fine and powerful a horse as he promised to be when first put to covering mares. When he gets to full age, he will not bear forcing with food to make him so fat as they wish him to be *to show him off* as a stallion. Now these very colts are selected when foals to be kept for stallions, because of their then promising appearance; and but for that promising shape, bone, size, &c., being better than the other foals belonging to the same person, would have been castrated the same as the other foals; the probability therefore is, that had they not been put to covering, most likely every mare they could procure to be sent to them at so young an age, and to be continued to be sent, would eventually have made fine, powerful, good stallions, and would have continued so for many years.

Some breeders of game cocks, independent of their in-breeding system of putting father to daughter, son to mother, and so forth, breed from male and female of different ages, under the idea of equalising the maturity of the seed; if they breed from a year old male, they put him to a five or six year old female; if the male is two years old, they put him to a four year old female, or in that degree of proportion of age; but I do not find any who breed from old male and old female; therefore, as in the case of bulls, there is no positive proof that both old ones would not be better than either, both young ones, or one old and the other young; or vice versa, unless it may be held as a corroborative proof, to which in fact it amounts, that finding them better from one old and the other young, than from both young ones, so would both, being of full age, be better than from one old and the other young.

Some breeders of horses, both of the hackney and racing sort, breed from an aged horse and a two or three year old filly, from the same principle as the breeders of game cocks, supposing, that by doing so, they produce finer horses; and it is particularly noticed, that the three year olds from such a system are finer animals than even those bred from sire and dam that are both of full age. The whole benefit in principle is, that it is better than breeding from parents that are both young; but it is worse than from those that are both full aged; and in practice there is a temporary benefit from it, or at least a benefit to the *breeder* of hackneys for sale, but a disadvantage to those purchasers who purchase horses for work; a benefit to those who want race horses to run for two or three year old stakes, but a loss to those who want them for aged stakes or plates, and to breed from for the purposes of their produce running for aged prizes. As the tree is, so will be the fruit; a horse is considered of full age at seven years old; but if a seven year old horse is put to a three year old filly, the produce may be considered at their full age when at the medium between the age of sire and dam, that is, five years old; therefore they are, when three years old, in comparison with those bred from parents both of full age, nearer the greatest perfection at which they will ever arrive, than the others; they have more early maturity; as high in stature; are better filled up and furnished in their parts, have more strength comparatively, and look more perfect; and therefore the breeder will sell him for more money to the dealer, and the dealer sell him for more money in a fair; but if the purchaser expect his new purchase to *wear well*, he will probably find himself deceived.

The three year old racer bred in this way will be attended with a similar result; suppose, for example, an aged horse was put to two mares, own sisters to each other, one seven years old, and had never been put to a horse, and the other three years old, and had every appearance of making as good a mare when at seven years old as her sister is; the produce from the three year old mare, when arrived at three years old, might possibly, and not improbably, at that age beat the produce from the seven years' old mare, all other matters of rearing and management being the same in both instances; but I apprehend that when they are both six or seven years old, the *tables would be turned;* if they run a three or four mile heat, with each twelve stone on her back, that produce from the seven years' old mare would distance, or double distance the other; and that is the least part of the benefit which would be derived from the produce from the seven years' old mare; it would run a *good one* for a greater number of years, and after that breed better stock. As a proof of this, the Doncaster St. Leger, with the Epsom, Derby, and Oaks stakes, will afford a corroboration; they being the largest stakes in the kingdom, and being for those of three years' old, and as many entered for them as for any other stakes, generally, the winners have every right, independent of accidents, and the roguery sometimes committed, to be considered the best three year olds of the year. Now, how many of those winners have run good ones as aged horses or mares? And how many of them have produced first-rate runners when aged, and first-rate stock getters? There may be more that have done so than I have any information of; but I have made many inquiries, and have only succeeded in one solitary instance, as quite a first-rater in running, and getting first-rate stock, and that is Orville, and he was a most extraordinary horse. I have been disappointed in not obtaining some information on this subject which has been applied for; but that is not so very important, as some of my readers may be able to investigate the matter more fully; and if they can prove that there are as good runners at full age, and as many of them, bred from young parents, as there are bred from old ones, which old ones had not bred when they themselves were young, I challenge them to the proof. I am, however, informed, that in the army, where they have much opportunity of knowing the durability and constitution of horses, having, except when in actual service, no very distressing long continued work to lame and injure them, and with good food in moderation, also regular work in the same degree, those which are good constitutioned continue in the same regiment for many years, while those that are bad, are soon found out and drafted from the regiment, or sold off; many of the inspectors of horses bought for the army, object to horses though their looks may be favourable, if they find that they came out of young mares, as they consider them good for nothing in comparison with those bred from older ones.

In those animals not required for labour, as sheep or horned cattle, the disadvantage which results is not quite so much as in those which are required for labour, as a part of what you lose in size you gain in fatness by early maturity; but in the horse, the foxhound, the greyhound, or even man, there is no having perfection in every attribute for speed, combined with power, vigour, and duration of it, constitution, or long life, if either sire or dam be much under full age at the time of producing offspring; it is worse than breeding at full age, yet the parts, the whole muscular and bony structure, not strengthened and perfectly developed, having been kept in ease and indolence, without the necessary exercise and exertion for that purpose; for by breeding from young parents, you have both these disadvantages united, like two streams running into one current, washing away the banks and barriers of the constitution.

It is an error common to many, as has been before observed, because young people or animals show more vigour than old ones, to suppose them calculated when young to breed better offspring than those of more mature age; and as a proof that such idea does prevail, and amongst those who are generally well informed and intelligent men, I will here state an anecdote of a celebrated barrister and very able advocate, himself not very young at the time. He was partial to coursing, and exceedingly fond of his greyhounds, and especially those he had bred and had been under his notice for a length of time; he had a favourite old bitch that had been put to different dogs without producing any whelps, and after having been disappointed several times by her not breeding, it occurred to him that a young dog would probably be more successful; consulting a friend on this subject, his friend jocosely recommended him to take the bitch with him the *Spring circuit;* the barrister knew the meaning of the jest, so let the subject drop. The meaning was in allusion to the time of the year most of this barrister's children were born, which reckoned from the time of his own return from the Spring circuit, when his lady, year after year, immediately became pregnant.

Buffon proves, that young persons and young animals generally are very full of juices, and mentions an instance of having himself squeezed from the nipple of a youth's breast, about thirteen years of age, nearly a table spoonful of fluid like milk; they have consequently abundance of seminal fluid when in health for some time before the age of puberty, as well as afterwards, but without the necessary abundance of organic particles, and not sufficiently perfect and powerful to procreate perfect offspring, because those particles are in request to fill up, furnish, and expand different organs and parts of the whole bodily frame while growing, therefore less surplus of them to be extracted from those organs, and directed to the seminal reservoirs; and those which are so extracted are necessarily less perfect, because the organs from which they are extracted are, as before stated, not perfect themselves. Buffon examined the seminal fluid of all ages with very great care and nicety, and found this uniform variation in those particles between young and more mature age, and between the latter and old age; between the healthy and the unhealthy, which perfectly corresponds with his theory, before given, of the growth and re-production of species. To breed, therefore, from young animals, so far from being contrary to the dictates of nature to disappoint their desire for sexual intercourse, which to gratify, would not be, as Gervase Markham shrewdly and quaintly expresses himself, when he enjoins "keeping the powers from spending till time of necessity," but would be contrary to both reason and well known facts, and not conducive to the future health and strength of the animals themselves, nor to their producing at that age perfect offspring.

Their inability to produce good offspring at a young age, is perfectly analogous to their bodily powers, as shown by their performance; for, as before stated, males being larger than females, require a longer time for the nutritive particles to penetrate into the organs, and expand the body to its destined size; so is a dog, or other animal of small stature when at his full growth, sooner arrived at his best power and strength than a dog of larger stature;

we often see small greyhound dogs when young beat, in a long course, larger ones of the same age, and of the same litter; yet in the following year, the larger ones will beat the smaller ones. I know many instances of it; but as I believe it is generally admitted to be so, there is no necessity for detailing them.

If we look around us at the young children of a numerous family, we find, when grown to manhood, the younger ones more powerful and strong in their constitutions, finer men and women, than the older branches of it. If the father marries while young, perhaps both father and mother not much more than twenty years of age, we not only find this effect, but we find the oldest of their children very often go into consumptions and die, when they should be in the prime of life; yet the younger make stout, healthy men and women. Many instances occur to my recollection, which I have seen in families, and to account for which I have often been puzzled at the time; and in conversations that I have lately had with many people on the subject of better animals being produced from full aged parents than from younger ones, this very fact of the younger children of families being stouter men and women than their older brothers and sisters, has been brought in confirmation of my argument, by those with whom I was conversing, they having often observed the same result; and this confirmation by them has been without my having, at the time, made the least allusion to the younger and older children of families.

There is an acknowledged inferiority in the running of a bitch after she has been put by, from taking the dog when on heat, (which will be considered in a future chapter,) and many coursers are induced thereby to put a young bitch to the dog at an earlier age than they otherwise would do; but I have, on many occasions, observed that those bred from old parents do not go on heat so soon by two or three years as other bitches do; and where there is no extraordinary excitement, or other cause, which may, and no doubt does, cause premature heat, it is, in all probability, governed by the age of the mother going to heat, or breeding if at heat, when young, which causes the daughter to go on heat at an earlier or later age; and therefore by not breeding from bitches until they are quite full aged, this injury which is experienced by disappointing a young bitch on heat, is very often avoided.

A proof of the benefit derived to a growing animal, by proper exercise, is seen in a three year old horse or mare when put into the horse-breaker's hands, in undergoing the necessary exercise or work for that purpose; it brings all the limbs and parts into action, stretches their muscular fibres, and promotes their future growth and strength to such a degree, that the benefit from it is obvious in their general appearance; they grow, fill up, and barnish very much more in the three, six, or more months afterwards, than in the same periods of time before they are put into the breaker's hands; this is so obvious to every common observer, that it is matter of surprise, breeders, instead of following up this manifestly apparent benefit, by a proper degree of work till they are arrived at their full measure of stature, and all their parts perfectly developed before breeding from them, that they should put the stallion colts at that age to covering mares; added to this obvious benefit from a proper degree of work while growing, is the equally obvious bad effect to the stallion himself, when he would otherwise be at his best, and continue a good stallion for many years afterwards; they on the contrary begin at their best age to scour and waste, and their produce to degenerate, as is clearly the case with the heavy draught horses, and acknowledged to be so by all experienced breeders of them.

If a colt at this age be what is commonly termed, *well* bred, and put to a mare also well bred, the produce is generally termed well bred. I should say, under such circumstances, that the produce is *ill* bred, however good the blood, the sort, the breed, or the organization (or whatever other term the fancy mongers may prefer) of their progenitors may be; the breeders, by doing so, are degenerating, or, I might say, ruining a good breed; and it is astonishing, under such a multiplicity of glaring and well known facts in proof of that being a bad system of breeding, that they should persist in it. The term well bred, in the common acceptation of it, under such circumstances, is grossly misapplied; yet nothing is more common than to hear an amateur of coursing, if he has a greyhound not a good runner, or its shape such as would not lead any one ever to expect that it would be a good runner, and other disadvantages attending it, say, it is well bred, and will do to breed from; the same with horses, when at the same time no greater error in breeding can be made, or a more erroneous fancy enter the imagination of any one.

A very great error is also committed with respect to mares, though they may have been truly well bred, of a good sort, and the breeding of them conducted with due regard to all the necessary considerations of proper age and constitution of their parents, well reared, with proper food and exercise, and all the et cæteras of a good system of management. With all these advantages, nature can do no more than it can; some of them are hacked and worked from time to time beyond their strength, their legs and feet in a constant state of inflammation and weariness, their joints and parts become ossified, and the natural constitution of their organs completely ruined; yet having proved themselves good ones, being of good blood, and well bred and reared, they expect them to breed a good foal, and they would say that the foal is *well* bred; this distinction of good blood, or a good sort, is necessary to be observed from that often misapplied term of "well bred;" as being well bred, or as being derived from good blood or of a good sort, are two very different things.

BEST TIME OF THE YEAR FOR BREEDING

AND

FEEDING BROOD BITCHES AND STALLION DOGS.

THE time of the year most suitable for breeding as being most propitious for rearing of the puppies, is worthy of some remarks, although the time of the year which bitches go to heat is not within our control, except by forced heats, from specifics, which some pretend to have the knowledge of, but to which knowledge I have no pretensions; nor would I use them if I had, a natural heat evidently being much better than a forced or artificial one. The time of the year is, however, necessary to be considered, as some bitches go oftener on heat, or with shorter intervals between the times of doing so, than others do. The most common time is the same time of the year on which they were on heat the preceding year, or twelve months' interval between the times; sometimes they are known to be as much as fifteen months; others nine, and some not more than six months; Mr. Hassall's Handy, when an old bitch, was seldom more than six months between one heat and her next; old bitches are generally a shorter time between heats than young ones. Where they go oftener on heat, there is a better opportunity of breeding from them at a favourable season of the year, and putting them by from taking the dog at an unfavourable season, and thus making a reserve of their "powers from spending till the time of necessity," than when they go on heat only once in twelve months.

There are many questions dependant on the time of the year the puppies are born, and two especially; namely, the most propitious season for fostering and nourishing the whelps in their tender age; and, secondly, the time they are qualified to run as puppies, which, according to immemorial custom, depends on the time of the year they are pupped. Horses for racing take the date of their age from the 1st of May, unless an alteration in the rules of the turf has recently been made in that respect, whether they are foaled in January, February, March, April, May, or June; so is the old custom for greyhounds to take their date from the 1st of January. Thus, those pupped on the 1st of January are qualified to run as puppies until the 31st of December next but one, or till two years old within one day; while those which are pupped on the 31st of December, only one day older than the former, can only run as puppies till one year old, or until the following 31st of December: this seems to have arisen, according to an old book which I have accidentally seen (but have forgotten the title of it) from their being no longer considered as puppies when they have seen two Christmases; a facetious old sportsman, however, and father of a very celebrated courser, gives a different definition of the distinction between a puppy and a dog; he says, "they are no longer puppies when they cock up their hind leg to make water; he never saw one do so until between one and two years old;" so that, I suppose, if a greyhound cock up his hind leg for this purpose, he would consider him no longer entitled to run for a puppy cup; how to define that with respect to bitches, he seemed at a loss for a criterion.

Where they continue to take the date of their age from the 1st of January, and it is so yet at some meetings, coursers endeavour to have their litters of whelps pupped as early in the year as they can, selecting those, in many cases, for their entries, which were pupped early, in preference to those pupped later in the year, even though the latter may appear the best puppies. But as the practice is becoming more prevalent, (for the conditions of entry being eighteen, or twenty, or more months old, as the subscribing parties agree,) than the mere definition of puppies as distinguished from dogs by being pupped before or after the first of January, and generally consider a dog and bitch above two years old, reckoning from the actual time of their birth, as disqualifying them to run for a puppy cup or stake, the time of the year they are pupped is of trivial importance in that respect, to that for the welfare of the whelps in their most tender age; and that is of very great importance, for if they are nipped in the bud, they seldom come to perfection afterwards; and if very much checked in their growth at that tender age, they never do.

It matters not whether this check to their growth and strength is from want of a good supply of new milk by its scarcity in winter, by being chilled with cold weather, or kept by the cold weather from taking so much of their natural playful exercise as they would do if the weather was warmer, or whether they are checked by an early attack of distemper; the latter may be, and often is, produced or hastened by the former; the weaker they are, the more they are pre-disposed for the reception, whether by contagion or other causes; and the weaker they are, the less able they are to withstand the attack; and if they can escape with life, being weak, they are longer under its baneful influence, and their future growth so much more checked by it. It reminds me of Shakespear's remark which he puts into the mouth of Brutus, when discussing with Cassius the policy of meeting, or not meeting, Octavius Cæsar and Mark Anthony at Philippi—

> "There is a tide in the affairs of man,
> Which taken at the flood, leads on to fortune;
> Omitted, the rest part of their lives
> Are bound in shallows and in miseries;"

and so it is with the greyhound puppy during its growth, and especially at its most tender age.

Arrian says, p. 142, and he is supported by all the Cynegetica, "The most favourable season for breeding is the spring of the year, as the temperature is mediate between hot and cold. Winter is not propitious for rearing puppies, more especially on account of milk; and summer is distressing to the dam for suckling. Autumn is worse than spring for this reason, that the winter arrests the whelps before they are thoroughly formed."

The Cynosophium specifies January and February as the best breeding months; and Fouillax gives the same reasons as Arrian for avoiding summer and autumn, and is followed verbatim by Turberville.—*Arrian's translator.*

Markham would "put them together to engender and breed, eyther in January, February, or March, according as they shall grow proud; for those are the three most principall monthes in the yeare for hound, bitches, or bratches, to be limed in; not but they may conceive and bring forth as good whelpes in other monthes; but because there will be much loss of time in entering them." He further enjoins, that, "the moon be eyther in the signe Aquarius or Gemini; for it is held amongst the best huntsmen of this land that the whelpes that are engendered under those two signes, will never run mad, and, for the most part, the litter will have at least double so many dogge whelpes as bitch whelpes." *Country Contentment*, B. 1, p. 26.

How unpropitious soever winter may be for rearing puppies on account of the scarcity of milk, it is quite a secondary and unimportant consideration in comparison with the temperature of the weather. For, in the first place, milk is more or less within the control of the breeder, if he will be at the expense of it; but if he either cannot afford that expense, or cannot find in his heart to bestow it upon his whelps, he had better drown them at once; "commit them, like the dwindling refuse, to the merciless flood." But, in the next place, the temperature of the weather is not within the breeder's control; and the more tender their age, the more essential it is, when they can run about, to have as much liberty as they can, and also encouragement to run, and skip, and jump about, in their own natural and playful manner; but if the weather be very cold, though they have their liberty, and are out of door, they sit shivering and huddling close together, wanting to be put in door again, instead of exercising all their little agilities, which warm weather encourages them to do. A few weeks before their dam leaving them, and a few weeks after, is the most critical and important time for laying the foundation of their future strength, and promoting liveliness in their dispositions, which, if properly encouraged, will induce a farther exertion of their little powers as they grow up.

Fronto says, that "the whelp of the pastoral dog requires to be fostered in warmth; and if an animal, necessarily of a hardy constitution, be, when young, impatient of severe cold, we shall readily acknowledge the importance of such a seasonable birth for the delicate Celtic whelp, as will give him, during the period of his growth, two summers for one winter."—*Arrian's trans.* p. 143.

There is also an additional advantage in having the puppies whelped early in the year; if they are whelped in February, for instance, they have warmth from their dam for a good deal of the month, and without running out of doors, by which time the weather often becomes warmer; then the following February or March, they will be old enough to have a trial of their speed, and with their general looks and shape, which may be judged of at that age, the breeder will be able to make up his mind which to draft, without being at the expense of keeping, all summer and autumn, such as are not worth keeping; for at thirteen or fourteen months old, a dog, if he is not very large and loosely made, which of course can also be judged of at that age, will run one moderate course in a day without injury, by which you can judge both of his speed and stoutness; and a bitch at a less age.

Arrian says, p. 130, "you may take a bitch out coursing after the eleventh month; or if she be well set, or not loose limbed, you may let go a hare from your hand before her, in an open field, a month earlier than this, starting the pup close to the hare, that she may enjoy the sight of her game, and, by seeing it quite closely, may work with eagerness." Again, p. 135, "Dog-puppies must not be taken out coursing until they are two years old, for their limbs become set at a much later period than those of bitches. Besides, it is attended with no little danger to take them out earlier, many a good greyhound having been prematurely destroyed by a severe course before he was full grown, and especially those of the greatest spirit and highest breeding; for, in consequence of their spirit, they run to the utmost of their power."

How widely different was Arrian's system in the less enlightened age of seventeen centuries past, to that pursued by many modern coursers in these *intellectual* days! for although he may have fixed a longer time than actually necessary before coursing the dog puppy, yet if he be *wrong,* it is on the *right side of the post.* And how admirably his idea of the dogs' limbs becoming set at a much later period than those of bitches, corresponds with Buffon's theory on that subject! We do not often, it is true, perceive any bodily injury a dog-puppy suffers from exertion only, though such injury may take place internally without being perceptible to us; but many would-be knowing coursers take dog-puppies out to course before they are one year old; and *often* course them at a year and only a few months old; but the principal injury from doing so is in bringing the march of intellect upon the greyhound that is run so often when young, and by which it appears that such intellect in their masters is retrograding, and being transferred from master to dog, which is a curious phenomenon in these acknowledged, and so much boasted of, intellectual times.

But I must return to the question of the best season of the year for breeding greyhounds, as the last alluded to, will be more fully canvassed under the question of rearing. If a bitch goes on heat at an unfavourable time of the year, it is a question how far it is advisable to put her to the dog, or put her by from taking him? should this be the case with a promising young bitch, I should certainly recommend the latter; and even if it is a full aged bitch, I should be inclined to do so, unless under circumstances where loss of time in procuring puppies is of some importance; that season of the year which is the most unfavourable for putting a bitch to a dog to breed, is, that part of the autumn nearest the commencement of the coursing season, or at the commencement of that season; because you lose the bitch's services in the field during a great part of the season, and the temperature of the weather is also unpropitious to the puppies at a very important time when they require the most warmth, and the best fostering.

I am nevertheless well aware that if a bitch is put by, when on heat, from taking the dog, that she runs much worse for it for some time afterwards; of this I could adduce numerous instances; but one striking and very satisfactory proof of it, and which, moreover, shows to what great extent it affects them, will suffice.

A very small blue bitch, Mr. Redhead's Leveret, was put down to run a match against Mr. Gurney's yellow and white bitch, Anna, at Swaffham, in 1823. I knew not at the time any thing of them, nor whose they were: Anna was a good sized, fine looking bitch, with her shapes and signs of good breeding quite perfect, and I thought her, at the time she was in the slips, to be as good a subject to grace a painting on canvass as any greyhound that had ever come under my notice, and, of course, expected to see her win the course; my anticipations were, however, far from being realized; for in a long course, where the hare suffered thirty or forty turns, Anna did not give one-fourth part of them; she seemed to run dead, as some term it; having neither fire, energy, nor vigour. This was in November, and on inquiry afterwards, for I was perfectly astonished, it proved to be a bitch which Mr. Gurney, at the commencement of the season, found to be the most speedy and the best greyhound in his numerous kennel, and was destined to have been entered for the cup at the Swaffham and Newmarket meetings in November; she, however, in the mean time came on heat, and so anxious was he to run her for the cup, as my informant stated, that he did not allow her to take the dog. Before the meeting took place, he found her so totally unfit to run for the cup, that he entered another in her stead, running her only a match.

The length of time this will continue to affect her is not easy to define; the generally received opinion is, that it affects her until such time as she would have suckled her puppies, and the milk left her in its regular course; and it is not improbable that such is the fact. Admitting such to be the case, I should draw this distinction. If she go on heat two or three months before the season commences, and if it is a full aged bitch that I wish to have puppies from as soon as possible, I should put her to the dog, especially where there is a warm kennel and plenty of room to run about and foster the puppies, so that their growth would not be stinted; but if I did not care about having puppies from her soon, I should not allow her to take the dog; at the same time, she ought not to be coursed till such time as her milk would otherwise have left her, and she would have perfectly recovered from the effects of breeding. So that in this case, the loss of her services in the field is the same in either case, and with a probability that she would go to heat earlier the following year, than if she had bred from that heat. And this I should prefer to putting her to any dog for the purpose of preventing the ill effect from putting her by from taking him, as some coursers do, and then drowning the whelps that she may the sooner get rid of her milk and be ready to course; for under these circumstances they are found to run equally as ill, and some say worse, and for a longer time, than if nature had taken its usual course; and such I apprehend to be the fact. And here I differ from Arrian, who says, p. 144, " If you wish a brood bitch to recover her previous speed, you must not let her suckle her whelps, except merely to lighten any excess of milk."

But if a bitch comes on heat after the coursing season has commenced, and her being useful or not for the field during the season, is a primary object, especially for public coursing, I should say, decisively, put her to the dog. I say this, independent of any consideration of the puppies; but that she will be more serviceable in the field by being put to the dog than by being put by from taking him; although Arrian says, that " a bitch may be taken out coursing for ten days after being warded, but no longer, on the authority of the Gratii Cyneg." I think that she may, with safety to herself and puppies, be coursed three times ten days afterwards. A bitch will recover her usual fire and energy in much less time than a dog after copulation; her generative organization is totally different from that of dogs; the exertion and consequent fatigue are by no means so great in the bitch as in the dog. In her, when the heat is gone off, nature is satisfied, and she is also relieved from that irritating restlessness consequent upon being on heat, takes her rest better, and rapidly regains her wonted appearance and strength. She generally runs as well a few weeks gone in pup, as bitches are ever known to do; hares are known to run remarkably strong when a short time gone with young. An instance of this was clearly shown some years ago, when a party went out to course on the 22d of March, with an injunction from the owner of the manor to leave off when they had killed two brace of hares. They ran nearly twenty hares from one fallow field, and only killed one brace; one of them was so near kindling, that when she was opened, which was done immediately, the little things actually jumped about on the ground. The party continued to course for the purpose of killing the other brace of hares, which was wanted on some particular occasion, but they coursed in vain, till all their dogs were tired out, and then sent for fresh ones; but the hares beat them also, and they were obliged to leave off without completing their number, although they had twelve brace of dogs or more.

Then with respect to which of the two ways she would be most serviceable in the field, if she were put by from taking the dog, she would be in her worst state for running the first part of the time after the heat was gone off (the reason will be more fully shown in another chapter) and although she will, after some time, improve, she will be equally long before she is in a fit state to course as if she had bred puppies; and if she were coursed before that time, whether a young bitch or one older that had not learned to wait in her running, it would be equally conducive towards giving her that propensity as if in ill health, or out of condition from other causes; therefore her services in the field are lost for the whole of the time, from the heat to the time she would have been entirely relieved from the effects of breeding; while, if she had bred, she would have been serviceable for three or four weeks after being put to the dog, giving that amount of balance for usefulness in the mean time in favour of putting her to the dog, without any likelihood of her being coursed at the latter part of the time of suckling her puppies, which would be the time most likely she would be taken out to course if she had not bred, and, consequently, less ultimate danger of giving her a waiting propensity; she should, nevertheless, after the heat is entirely subsided, have a few days or a week to recover her wonted strength, which, when she has been warded, she will do very rapidly. The same caution should be observed after she has done suckling her puppies.

Arrian says, p. 151, "If you do not wish, as yet, your bitches to breed up any puppies, you must take the greatest possible care of them while under distress in consequence; for when they have ceased to give suck, their teats become turgid and full of milk, and the parts beneath the belly distended, at which time it is not safe to loose them after a hare, for their flanks may be burst asunder; nor should you let them play with another dog, as, by contending and striving with him beyond their strength, they may be placed in equal danger. It is best to wait till their teats become flaccid; and you will have a proof that it is safe to take them out, when the hair falls off abundantly as you stroke it with your hand. They are then, I think, free from the distress they labour under on account of their milk, and are ready for coursing."

"Schnieder is of opinion, that Arrian is here cautioning the courser against running a bitch, whom it has been deemed prudent to put aside from taking the dog, and whose milk vessels are distended towards the close of the period of gestation, as if she were actually pregnant."—*Arrian Translated*, p. 50.

But such cannot be Arrian's meaning, else why use the words "when they have ceased to give suck?" At the same time, Schnieder shows, by his remark, that he was aware of a bitch's unfit state for coursing, after she has been put aside from taking the dog.

The Feeding of Brood Bitches and Stallion Dogs.

Arrian says nothing of any necessity for a preparation of the state of the bitch's blood and habit of body, previous to the time she is expected to come on heat; but such preparation, in some degree, is quite essential, both to the bitch herself, and for the healthiness of her puppies; bitches should, of course, be strong and in good general health, but their blood should be as free as possible from impurities, that nature may have its ordinary course; the nourishment conveyed to the fœtuses in the womb is conveyed by the blood, and that nourishment is affected by the state of the blood, and if full of impurities, it affects the health and strength of the young in their first formation, which pre-disposes them for the reception of distemper.

That their coming on heat is considered by many to depend on the state of their body is shown by many coursers, when a bitch does not come on heat so soon as they wish, giving her specifics, or keeping her on higher food, which of course produces a greater bodily heat and more excitement, and consequently may cause her to come sooner on heat than she would do if the body and blood were in its naturally cool state.

Their thus forcing the heat is sacrificing their chance of having a superior produce, to their impatience, or fancy of having their puppies whelped at a particular period. But if I wanted a bitch to come on heat at any particular period, I should, two or three weeks before that period, cleanse her blood well from impurities by vegetable purgative medicines. It is true, that if she were about to come on heat, such medicines would delay the heat a short time; but if she is not coming on heat, those medicines, by purifying her blood, would cause her food afterwards to be so much more stimulating and strengthening to her, as is the case, and the only necessity for purgatives, before getting a greyhonnd or a horse in coursing or racing condition; and by thus invigorating her without impurities would be quite as likely to produce her heat for taking the dog, as producing strength and condition for coursing, and be far preferable to forcing her heat by foul and impure, though stimulating food.

Flesh is the most stimulating food generally given to them; raw flesh contains more nutriment than when cooked, as much nutriment goes off by evaporation under culinary process; but for bitches, before they come on heat, while the heat is on them, and while in pup, or suckling, and indeed when in training for coursing, the flesh should undergo a moderate degree of culinary process, as what little you lose in nutriment you gain in getting rid of the raw, foul, heavy, and watery parts, such as are most conducive towards filling the blood with impurities. They ought, nevertheless, at such times, to have plenty of nutritious food. The translator of Arrian says, p. 143, " It is an essential part of kennel management to support brood bitches with most nutritious aliment. Varro (in Geoponiis) recommends barley bread in preference to wheaten, as more nutritious, with mutton broth from bones, &c., poured over the bread, to be given before whelping; and afterwards, barley meal, with cows' or goats' milk, boiled bones, and water to drink. The same instructions are delivered almost by Varro, de Re Rustica. In the latter reference, the author expressly says, the bitches are more nourished by barley than wheaten bread. But the experiments of the late Sir H. Davy on the quantum of nutritious matter contained in the different varieties of bread corn, and the test to which they have been put, in kennel feeding, by practical sportsmen, induce us to believe, that the Scriptores de Re Rustica are mistaken on this point. The farina of wheat is the best food for brood bitches, boiled with milk, or scalded with meat broth. On the importance of keeping brood bitches on highly nutritious food, the old huntsman, Pan, was fully aware; for Diana found him carving a lynx for their repast."

Bones, which contain much oily and nutritious matter, are a most essential food for bitches during pregnancy, and while suckling her puppies; every one knows the dog's peculiarly eager propensity for eating bone, and therefore bone may be considered as natural a food for him as any which he eats; but on these occasions bone must contribute as much as any food to produce plenty of bone in the offspring; lime, and phosphate of lime, are the greatest portion of the elementary matter composing bone; "if you analyze the urine of a young dog," says Dr. Ferguson, "no phosphate of lime is found in it; while, in the urine of an aged dog, it is found in its regular proportions." Thus, what bone a dog eats, while growing, and the formation of his limbs and body are establishing, contributes materially to increase his bony substance, as the phosphate of lime is all directed to the formation of bone; flesh contains the next greatest proportion of phosphate of lime to bone, and we see, what will be more fully noticed under the consideration of rearing, that greyhound puppies reared in the butchery, where they live chiefly on raw foul offal, are more robust, often less lengthy, and also coarser in their looks, than those reared at a dairy, where milk, whey, and crushings from cheese abound, and but little flesh offal. Now, it has before been shown, that as the food of the mother is, so is the quality of her milk; consequently, as her food contains a greater or less portion of phosphate of lime, so will her puppies be more or less assisted by it in the formation of their bony substance; and this equally applies to the food the mother eats during pregnancy, and providing nourishment for the fœtuses, with this additional consideration, that it is at the time of the *first* formation of the bony substance in those fœtuses, and therefore of more primary importance at that time than at any other.

Either brood bitches or stallion dogs should be tolerably well fed in general, to be always ready for the purpose of breeding; but a system of constantly feeding them with what they will eat of raw flesh or butchery's offal, would fill them with impurities, and be inimical to procreation; they should nevertheless have a moderate portion of flesh most days, with bread, vegetables, and bone, to make up their full meal; they should also have a change of diet as often as can be made convenient, either in different sorts of flesh, or the vegetables varied, with sometimes wheaten and at others oaten bread; with tolerable plenty of it, and plenty of exercise, they are always ready.

"If you wish," says Arrian, p. 144, "a brood bitch to recover her previous speed, you must not let her suckle her whelps, except merely to lighten any excess of milk, and then put them to other bitches, selecting such as are well bred; for the milk of degenerate curs is not congenial to high bred puppies. If, however, the dam appear no longer serviceable for coursing, it is best to leave the whelps with their own mother, and not to put them to a foster parent. For the growth is stinted by a stranger's nursing (as the other Xenophon declares) but the mother's milk and breath are cherishing to her puppies." His translator says, p. 144—147, "Whether the bitch be required for the field again or not, no humane courser will allow her to suckle more than four or five whelps. If she be young, Calumella advises that the first litter be taken from her. Namesian also destroys the first litter, and the smallest puppies of subsequent litters. Fronto also agrees with him, and out of a litter of seven, recommends only four being kept with the mother. Demetrius recommends the heaviest whelps to be placed under their own dam."

Markham says of puppies or young whelps, " those which are raw boned, leane, loose made, sickle or crooked hough, and generally unknit in every member, are ever likely to make the best dogges, and most shapely; but such as are, in the first three or four months, round, close trussed, fat, straight, and as it were summed and well knit in every member, never prove good, swift, nor comely."

" Of nurse bitches, Sir Thomas Elyot enjoins, should be of no servile condition, or vyce notable. Turberville says, when a bitch hath whelpes, let a mastiff bitch give suck to one half, and you shall find that they will never be so good as those which the dam did bring up."

There is a variety of circumstances which should govern the breeder's decision with respect to how many whelps he will allow the dam to suckle; if you destroy a part of them, you may, for any thing you know to the contrary, destroy the only ones worth rearing, for it very often happens, that there are two or three much better than any of the others, and sometimes only one which proves good, the others quite inferior; and it is an acknowledged principle, that none but the best of litters should be bred from, as to breed from the worst is sure to deteriorate the breed.

If a bitch has ten whelps, those ten cannot each have so great a portion of the mother's nourishment as if there were only five; but this is of small consequence for the first two or three weeks, provided the dam is healthy, and has a good supply of milk, as during that time the whelps take each but a small quantity; as they get larger and stronger, they require more, but they are then getting sufficiently old to have substitutes for mothers' milk in part of their nourishment, which assists the mother; and is not only as conducive to their growth and strength, taken alternately with her milk, but is very useful in preparing them, by a gradual transition, for eventually leaving off sucking the dam, without injury to themselves, which would be the consequence of a sudden transition from mothers' to cows' milk, or to any other. If the dam is young, weakly, or in ill health, the fewer whelps she suckles the better.

There is another point which I have not seen alluded to by any of these authors, but is a necessary consideration in producing good puppies, before putting sire and dam together; and that is, exercise, as conducive to their good health, which is very essential at the time of procreation. I will, however, first relate a circumstance, the result of which may be deemed an exception to a general rule, and nature will sometimes work wonders. This extraordinary occurrence took place in the late Mr. Mundy's kennel, and was the cause of his celebrated dog, Wonder, having that name given to him.

Sir Samuel Fludyer sent his bitch, Wagtail, given to him by King George the Third, to Mr. Mundy, requesting she might be put to his dog, Galland, (the Stud Book states Wonder to be by Galliard; but Galliard was own brother to Wonder, of the same litter, by Galland.) Mr. Mundy was from home, and uncertain when he would return, and Galland was but just getting better of the distemper, or some other severe illness; the servants, at a loss what to do, waited till night before they concluded, thinking he might come home by then; but as he did not do so, the servant who brought the bitch said to Pym, Mr. Mundy's servant in the care of his dogs, "If you will trust the dog I will trust the bitch;" so it was agreed, and they were put together. Next morning the servant went home with the bitch, after which Mr. Mundy came home, and Pym informed him what they had done. "Well, Pym," he says, "you have done what I durst not have ventured to do; but however, we shall see how it turns out." In a regular course, Wagtail brought forth six puppies; three of which, two dogs and a bitch, were sent to Mr. Mundy. When they were old enough to have a trial of their speed, the black and white dog showed himself possessed of such extraordinary powers, that Mr. Mundy said, "Well, Pym, but this is wonderful indeed! and we will call him Wonder. The yellow and white dog also proved himself very good, to which he gave the name of Galliard, to go with the letter of his sire. Galliard was sent to Major Topham, to try his strength against the Yorkshire dogs, who ran him two courses with the celebrated Snowball, the first of which the Major saw but little of, and of the second, a good course, he saw the whole, and considered Galliard to have the best of it; in consequence he obtained leave to keep him in exchange for Susan, sister to Snowdrop by Snowball; the next Malton meeting, 1806, Galliard won the cup.

Now, although this may be considered an exception to a general rule, it yet affords some useful instruction. It shows a wide distinction between an animal being in a state of illness, *before* the disorder is at its height, and *after*, when nature has mastered it; in the former, all the organic as well as nutritive particles, the several juices, and requisites for supporting the body and for procreation, are locked up and confined with the impurities and blood altogether in a state of fever with its attendant debility, and incapable of separation from each other, to be directed to their respective purposes; in the latter, when the disorder is turned, the fever abates, and the good particles separate from the impure ones, the good are directed to their appointed reservoirs and purposes, and the bad work off by evacuations and perspiration, which relieves the animal, and restores his wonted strength and vigour.

Thus, as in the instance of Galland, while he could procreate good offspring in a few days after the turn of his disorder, the same number of days before that turn, although the quantum of strength lost in that time might be supposed to be equal to the quantum gained in those few days after the turn, yet he, in the first place, would have no desire to serve the bitch, or if he had, he would not be able to do it effectually.

It is the same in the brewer's mash-tun; in the best malt, the whole farina of the barley corn is not converted into saccharine matter, a small portion being left as mucilage to give body to the liquor as well as spirit, which is derived principally from the saccharine part of the malt; but if there be not a sufficient portion of the farina of the barley converted into saccharine matter, and too great a portion of mucilage left in it, or, as the brewers term it, the malt is too flinty, that flinty part not only is, in a measure, lost for the purposes of producing liquor, but it absorbs a portion of the liquor derived from the saccharine portion of the malt, or, as they term it, the good liquor is locked up with the mucilage; and in some cases it is so to such a degree, and especially if the water is put on too hot, that no liquor whatever will run off from the mash-tun.

It is similar with the liquor after fermentation; if the cask into which it is drawn, after being cleansed from the yeast, be left unstopped, and the liquor allowed to get quite cool, it will not be so fine as if the cask were closely stopped up; the heavy and lighter particles combining together, cannot so easily separate without its having, what the brewer terms, a *sweat;* by being closely stopped from any air getting to it, a small degree of fermentation is produced, causing heat; when that has taken place to a sufficient degree, it liberates the particles from each other, and, as the liquor gradually cools, the heavier particles will subside to the bottom of the cask, leaving the lighter ones at the top, and the liquor is then fine, as the fineness of the liquor is the finest and lightest particles of which it is composed.

Now a man, who is in the constant habit of drinking to excess day after day, and is therefore constantly full of impurities in the blood, and consequently in a degree of fever, which is similar, though not in so great a degree, to Galland's illness, is in a very unfit state for procreation; he may have what is termed a false appetite for it, yet can only procreate with difficulty, if at all; but let him have one strong perspiration, or more than one, by labour or otherwise, and be relieved from the consequent fatigue, he will have a stronger call of nature for sexual intercourse than in his general habit, and will procreate more effectually; the nutritive particles before accumulating, but confined with the impurities, are set at liberty, and directed to their proper purposes, by which the organic particles are in greater abundance, the seminal fluid more copious, and further augmented by those organic particles being transmitted to the seminal reservoirs.

This effect is experienced in some degree by men who are not eating or drinking to excess and for a long continued time; but who are in good general health, and of regular habits, both in their living and exercise; if they happen to have extraordinary exertion for a sufficient time to create a copious perspiration, they feel, after resting, and recovering from their fatigue, an extra call of nature in the same manner. A similar effect as that experienced from perspiration, is also found from purgative medicines; if a man is in regular habits, living in moderation, with moderate exercise, a purgative is useful in causing a separation of the particles, by which he will procreate more freely; but if he has been living to excess for any length of time, if only one day, either a strong perspiration or purgative medicine is absolutely necessary for his free procreation. The opposite effect is found where a man has been living very low, with an insufficiency of food, and that poor and unstimulating, if in good general health, one meal of good substantial food will cause an additional desire and vigour.

This principle, therefore, strictly applies to the question of exercise in animals which are required to breed from, and the fitness of their state for that purpose; and if it makes this difference where men are in regular and moderate habits of living and exercise, how much greater difference it must make between a stallion greyhound or horse being generally, or indeed in some cases, constantly confined within the kennel or stable? I have not any particular cases to offer in proof of horses which travel their weekly rounds for the purpose of covering mares, getting better stock than those kept always at home for that purpose; but I do not doubt their ability, not only to get better stock, but to cover a greater number of mares effectually in a given space of time by travelling a moderate distance most days; Buffon proves that extreme fatness is at the expense of the seminal reservoirs; and by being confined constantly in the stable, there is no opportunity of working off the super-abundance of fatty matter, or of ridding the blood and system of impurities by exercise, nor can the general health be so good. It would be very unwise to allow a stallion greyhound his free liberty to range, for instance, all over a market town, making a common hack of himself in serving *every longing dame of all ranks and degrees;* that would be the opposite extreme of constant confinement; but whether old or young; whether wanted to course, or kept entirely as a stallion, he ought to have a fair portion of exercise most days.

Giving bitches at heat exercise, is out of the question, so far as allowing them liberty to range where they please, as either the dog intended, would ward her before the proper time, of which more hereafter, or some cur might ward her; they ought nevertheless to have some exercise when it can be given safely. I knew a bitch that had been on heat more than a week, brought several miles, and put to the dog immediately, warded, and taken off home again without waiting, altogether, above half an hour, and she produced twelve whelps; now here was exercise immediately before being warded, and immediately after it; eight of these puppies, that is, before being two years old, were sold to different gentlemen at prices amounting together to the sum of one hundred and twenty pounds; two were given away when sucking whelps, and I believe the other two died.

Arrian says, p. 140, " It is best for the dog and bitch to be shut up by themselves, and to be out of sight while together. For open and public copulations, if we may believe sportsmen, are not prolific; but such as are effected in private are reported to succeed." His translator adds, " This ridiculous notion, though doubtfully advanced in the Manual, is supported by many of the old Cynegetica. The credulous author of the Cynographia Curiosa adds to the absurdity of the notion, by saying, '*Si tum vidiantur canes, venationi inutiles parient*,' borrowing the same from the Cynosophium, where such an opinion is said to be the result of long experience."

But to return to exercise. Arrian says, p. 141, " Bitches, after being warded, may be led out, as walking about is conducive to their strength; but they must not be slipped again to a hare, for fear of being destroyed, by overstraining and excessive fatigue." The Gratii Cyneg. says, that " walking exercise should be continued till the period of parturition arrives."

There is, however ridiculous the notion may appear of the necessity for private copulation, some difference in the shyness of both dogs and bitches, and the remark is not altogether unworthy of notice; and if you could be certain, when shut up by themselves, of the bitch having been fairly and closely warded, there would be no objection to it; and such may be ascertained by occasionally watching them during the time, because they generally hang together for some time afterwards; this, however, depends on whether there is any shyness or not. There can, however, be no question as to the utility of exercise afterwards to the bitch, and for several days, so that she is secure from being again warded, either by the same dog or any other; and when too heavy in pup for coursing, they should have their entire liberty to take their own exercise, for even with that exercise some purgatives are necessary, to have them as free from impurities in the blood as possible at that particular period; and without exercise they would require stronger purgatives; but without either exercise or purgatives I should expect the whelps, or most of them, to die of distemper or some other disorder, before many months old, especially if the dam were fed of coarse, heavy, foul offal.

I will here mention an instance of exercise immediately before copulation, and that of very strong exercise, many years ago, near Louth, in Lincolnshire. A dog and bitch were slipped at a hare, which ran for covert at Withcall Brackens; the wind was exceedingly rough and boisterous, and blew directly from the covert to where the hare was started, so that it was impossible for the company to get on after the dogs with any expedition; and it was some time before any one of the company got to the Brackens, and when there, they found the hare lying dead on the ground, and the dog warding the bitch. The produce, generally, were good; and one dog whelp, reared by that worthy and kind hearted man, Mr. George Chaplin, of Tathwell, the patron of the Louth Coursing Club, (and long may he live to remain so,) proved so extraordinarily good, that he considered him the best greyhound he was ever possessed of. The dog and bitch would of course, when they had killed the hare, as usual, lie down to rest till they had recovered their wind, and until that was done, probably the dog would not perceive the bitch being on heat; but with all this, there was plenty of time before the company got to them.

BEST PERIOD OF THE FEMALE'S SEASON

FOR

BREEDING, &c.

The heat, or time the females of animals are in season for breeding, is evidently a provision of nature, in their different organization from that of the male, to give the proper adaptation for procreation to the generative faculties. The females of animals are only capable of procreating with success during that season; while, with the human species, during the flowing of the menses, a provision equally for the same purpose, the females have less or no desire than they have during the intervals between each flowing of them; the males of most animals are capable of procreating at any period of the year. This, however, is not the case with the males of all animals; as this fact has a particular coincidence with the consideration of certain cases relative to the females, I will, before going further into the consideration of that point, add an extract from Buffon's Natural History, printed for Thomas Kelly, 17, Paternoster-row, London, 1828, and in a course of experiments, he says, p. 164, " Having procured, at different times, the testicles and seminal vessels of twelve or thirteen rams, recently after they were killed, I could not find either in the epidydimis or seminal vessels a quantity of semen sufficient for observation. In the small drops I could collect, I found nothing but globules without motion. I cut several testicles in two longitudinally, and having collected a small drop of liquor, I could perceive nothing but motionless globules of different sizes. As these experiments were made in March, I imagined that, by repeating them in October, which is the time of rutting, I might find more liquor in the vessels. I cut the testicles of three rams into four parts, and put each part into a glass vessel, with sufficient water to cover them, and closed the vessels so closely as to exclude the air. After four days I found the liquor full of moving bodies.

"In the following October, I opened a ram, and found a great quantity of seminal liquor in the epidydimis. Having examined it with the microscope, I saw such an innumerable multitude of moving bodies, that the liquor seemed to be entirely composed of them. As the liquor was too thick, I diluted it with water; but I was astonished to find, that the water had stopped all motion in the bodies; though I saw them distinctly in the liquor, they were all at absolute rest. Having frequently repeated the same experiments, I discovered that cold water, which diluted the seminal liquor of other animals, made that of the ram coagulate."

From this we see, that even the males, whose season for breeding is at a particular period of the year, are either without the animalcules or living organic particles essential for procreation; or, if not without them in the bodily system, they are in a torpid state, and require animating to render them capable of reproduction of species, of which they are incapable, without being decomposed by some process, natural or artificial.

With respect to the length of time which should elapse after the bitch comes on heat before putting her to the dog, Arrian says, p. 137, "Watch the opportunity of the bitch being clear of vaginal blood; for if she receive the seed before, it generally is not retained, but is washed out by the blood; and you must here pay her particular attention, as it is only for a short interval of time that she preserves her heat, after the vaginal blood has stopped."

His translator adds, "The son of Gryllus recommends the same watchful delay to insure a fruitful intercourse; that is, when the heat is beginning to remit a little."

This caution of Arrian's is well worthy of the breeder's attention, for it is too common a practice to pay no regard to the time she has been on heat; if she will take the dog, he considers that quite sufficient; but such is an erroneous idea. There are many other circumstances require taking into the account beside that of the seed being washed out; and although there is some danger of that being done by the flowing of the blood (or whatever matter it is which flows, commonly called the blood, and only from its being coloured by coming in contact with it;) and the seed being washed out by it, is the least important of any of those other circumstances towards producing a fruitful intercourse.

Nature has various functions to perform, to give the proper aptitude for procreation during the operation of the heat; the aptness of the general organization of the generative faculties; the direction of the juices and matter from the nutritive particles to their required purposes to purposes different from their previous destination; the generating or animating the animalcules or living organic particles; to enlarge what Buffon terms the glandulous bodies attached to the ovaria, and the production of matter to sustain the young in the womb, and ultimately to become milk for sustenance after birth. There is every reason to conclude that the production or generating of this matter commences with the commencement of the heat.

During all this process, the bitch is in a feverish state of irritability, and of internal inflammation. It is clearly shown by her own actions that she is not in so fit a state of aptitude to procreate at one stage of the heat, as at another; very few will take the dog off several days after the commencement of it; even in the middle, or what may be termed the hottest part of it, which many breeders consider the best time, they will not take him kindly; while at quite the latter part of it, they will fondly court him to it.

That the preparation for the ultimate production of milk takes place at or about the commencement of the heat, we may safely conclude to be the case from Magendie's remark; "each mammæ has twelve or fifteen excretory canals, which open on the top, or upon the sides of the nipple. The arteries that go to the mammæ are small, but *very numerous;* they have abundance of lymphatic vessels, as well as *nerves;* thus they possess a strong sensibility. Up to the period of fecundation, the mammæ are inactive, or at least have no *apparent* secretion; but from the first periods of pregnancy, particular prickling and shooting sensations are felt in them, and they increase in size. After a certain time, especially about the end of gestation, a serous fluid flows from the nipple, which is sometimes in considerable abundance, and is called colostrum. The secretion has often the same character for two or three days after parturition; but the milk, properly so called, soon appears, and it is this liquid which the mammæ furnish until the termination of nursing."

Magendie is here alluding to the human species; but in animals the principles of the organization are the same, especially in the dog species; the mammæ commence their secretion of matter for the production of colostrum, which mix with and convert the daily nutritious particles finally into milk. The more external reservoirs for milk in various animals, show that it is a longer or shorter time in its preparation, according as those animals are a longer or shorter time pregnant with young. A cow or mare, for instance, shows this augmentation of supply of milky matter, a very much longer time before the birth of the young, than the ewe; and the latter a longer time than the bitch. The fœtus, which, by many is considered as being wholly nourished by the blood of the mother, is only partly so; as, according to Buffon's experiments, the vessels conveying the nourishment to the fœtus, have a mixture of other matter with the blood, which gives it a whitish appearance.

"The animalcules," says Magendie, "only exist in individuals fit for procreation; they do not exist in female animals except in their season for breeding; nor in women just before menstruation, which commences at the age of puberty, at which time these animalcules give the aptitude for breeding; they cease to have menstruation and the animalcules at the age of leaving off breeding. Instances have been known of the return of the menses in females at near eighty years of age, who have again become mothers. During the flowing of them, they are subject to great irritability; the least noise frightens them; they are affected by the smallest contradiction, and are very irascible."

It is also evident that these animalcules require some time in being animated from their torpid state; Magendie says, "in the semen, examined by a microscope, multitudes of animalcules are observed in it, which appear to have a round head, and a pretty long tail; the animalcules move with considerable rapidity; they seem to fly the light and seek the shade. Gloomy affections, diseases, excess, cause them to disappear." But Buffon, who has minutely examined the seminal fluid of bitches in various stages of their heat, thinks the tail of the animalcula is not a proper definition, as it does not form a component part of the animalcules, but is a slimy matter adhering to it, and in which he seems to think it was previously enclosed or embodied; in the first stage of the heat, it has this appearance of a tail, but does not move with that rapidity which it ultimately does from place to place, but sideways, and appears to be struggling to get at liberty from it; in further examinations, as the heat proceeds, this apparent tail becomes shorter and finer, and eventually separates from the head, when the latter moves all ways with the utmost rapidity and animation. This takes place about the same time that the inflammation of the glandulous bodies attached to the ovaria subsides, which is towards the close of the heat. They are then sometimes seen to alter their shape from a globular to an oblong form, and, occasionally, thinner in the middle than at either end.

Buffon says, "Having dissected a young bitch that had never been in season, I discovered on one of the testicles only, a small protuberance, which I imagined to be the rudiments of a glandulous body. The small quantity of liquor which was squeezed from the testicles contained no moving bodies. In another bitch, still younger, there was no appearance of glandulous bodies on the testicles; their surface was white and perfectly smooth. I compared these female testicles with those of the male of the same age, and found that their internal texture, which was fleshy, was nearly of the same nature."

"A live bitch was dissected, which had been four or five days in season, without having had any communication with the male. The testicles were as large as filberts. On one of them I found a *red* prominent glandulous body of the size of a pea, which had a perfect resemblance to a little nipple, with a visible fissure, that had two lips, one of which was more prominent than the other. Having opened this fissure, a liquor distilled from it, which I collected for examination. I then examined this liquor with the microscope, and had the satisfaction of perceiving, at the first glance, moving bodies with tails. I repeated the experiment with fresh drops, no less than ten times, in all of which the phenomena were precisely the same."

"Another bitch was opened which had been *eight* days in season, and had not received the male. I examined the testicles, and upon each I found a glandulous body in *full perfection.*"

Now, here we find a difference in the testicles between a young bitch and one of full age; also a difference in those of full age dependant on how long they have been on heat; this routine of preparation for a fit state of aptitude for breeding, attended as it is with fever, inflammation and irritability, must be a great disadvantage if put together during that routine, before all the parts are ripe, free, and ready for the purpose. There is not only the danger of no impregnation taking place, but less probability of a fruitful intercourse in the number of puppies produced by it, and, moreover, of those puppies not being so perfect as they would be if the bitch were in a fit and proper state to take the dog. It is perfectly analogous to the question of breeding, or not breeding, from either dog or bitch, or any other animal, before arrived at the age of maturity; the only difference is, one being the maturity and ripeness of the bitch's generative attributes; the other, the maturity of the body producing those attributes; to have a perfect good dog, he must be born a good one, and to be born good ones there must be no imperfection in the health, or other fit state of the parents for procreation.

I have a case from an intelligent amateur of bull and terrier dogs, who has bred many litters from one bitch; he has put the dog to her only once, and that at the early stage of the heat, and has had very few puppies; he has, on another occasion, put the dog to her at the early stage of the heat, and again two or three times during it, and has had but few puppies; at another time, he has put the dog to her only once, and that at the latest stage of the heat, and she has then produced more than twice the number of puppies which her other breedings produced. What is of still more importance, they were, when grown to full age, evidently better dogs; more *tommy,* as their term is; rounder heads, and show more of the true breed; more muscular in their bodies and legs; more ferocity in their countenances, and more savage.

Another instance, is a greyhound bitch that was put to the dog five days after her heat came on; she allowed the dog to smell, and appeared ready, but when he made his attempt toward her, she flew at him quite savage: the following day, by muzzling her, and some other means, she was closely warded; she remained on heat *more than a week afterwards.* On her previous heat, she was put to a dog at the latter stage of it, and quite courted the dog, which was a young one, to it, and had never been put to a bitch before; that breeding produced eight puppies. The other breeding produced only five, four dogs and one bitch: what is more worthy of remark, the bitch had *no tail,* and was otherwise so defective that it died in the course of the following night. Of the four dog whelps, one died about three months old, of the distemper; another has become quite deformed, probably from weakness, in his back and shoulders; the other two are promising puppies, now eleven months old; if any defect is found in their running, it may fairly be attributed to the mother's unfit state for being put to the dog, as both sire and dam are known good ones.

In this case there must be some peculiar prevailing cause for the disparity in the number produced of each sex; what can more rationally be supposed to be that cause, than the bitch not being in a fit state for procreation, her animalcules and generative faculties not fully ripe and matured? The seed of the male has, where both male and female are in an equal state of health, age, &c., a predominating influence over that of the female, in some small degree; but that only produces a trifling difference in the number of each sex produced; so that in this case, the dog's seed must have had a more than usual predominating influence over that of the bitch, and which can be from no other cause than her being put to the dog *too soon*, and that by many days, as they were both nearly equal in age, both healthy and in good condition. If you reap wheat, or other grain, before it is ripe, when cut down, its bulk will be nearly as large as when quite ripe, but when dried, and fit to be housed, it will shrivel into a much smaller and inferior grain than that which was nearly ripe when it was cut. Such unripe grain when sown will grow, and produce fresh grain, yet neither of so good a quality nor so abundant in quantity as from grain that was ripe when cut down.

Cows are in season for breeding only about two days; mares a week, or sometimes two; yet many breeders are aware of the danger of their proving barren if put to the male at the early stage of their season, because they have experienced the difference in the result. Arrian, and the son of Gryllus, as we have before seen, recommend the latest stage of the heat for the bitch to be put to the dog; but although Arrian's assigned reason is not so important as the other before-mentioned reasons, as physiological knowledge has made rapid strides since their time, and particularly within the last two centuries, yet they founded their opinion on their own experience from observing the difference resulting from an early or later stage of the heat. There is, therefore, not only our own experience of the result, but the result of those who were possessed of wisdom and acute observation in olden times, to support the doctrine of more modern philosophical and physiological authors on the subject.

Buffon says, "Mr. Needham's experiments demonstrate, that the seminal fluid consists of particles in quest of organization; that, in fact, it produces organized bodies. It is indeed probable, that these organized bodies are only a kind of instrument for perfecting the semen, and bestowing on it an active force; and that it is by their internal action that they intimately penetrate the seminal fluid of the female."

Magendie says, "If the most recent works of physiology are to be credited, the uterus during impregnation opens a little, draws in the semen by aspiration, and directs it to the ovarium by means of the Fallopian tubes. The contact of the semen determines the rupture of one of the vesicles, and the fluid that passes from it, or the vesicle itself, passes into the uterus where the new individual is developed." According to Prevost and Dumas, "animalcules must be indispensable to impregnation; a very small grain or corpuscle descends into the tube and meets the animalcules, which fecundate it *several days after the approach of the sexes.*"

As the efforts of nature, during the process of giving a proper adaption to the generative faculties for procreation, cause a feverish state of irritability to the whole system; and this being made manifest by the actions of the female during the former part of that process, and even till near the termination of her heat, while towards that termination she shows not only a willingness, but also a desire for copulation; we may therefore rationally conclude that the irritability, fever, and inflammation, have subsided, and that the whole system is, comparatively, in a state of repose. The generative faculties are ripe and matured, and when those are satisfied by the conjunction of the sexes, the heat goes off at the time prescribed by nature, and every thing goes on in its regular and natural course. In this way we see, after the heat has entirely subsided, and a short time to recover from its effects, that bitches will run as well as at any other time.

A coursing friend of mine sent three different bitches, at different times, to be put to the dog, when they had been on the heat nine days, and they each brought nine whelps; I know numerous instances where there has been a numerous litter from the bitch not being warded till very late in the heat, and a few that have been warded at the early part, and warded again once or twice during the heat; but I do not know a single instance of a numerous litter where the bitch has only been warded in the first part of the heat.

It must therefore be evident, under all the circumstances, that the bitch is more prolific at the few last days of her heat than at any other period of it; and that there is every reason to expect, not only the most numerous litter from putting her to the dog at that time, but that they will ultimately prove the best in power and speed. Although the reason which Arrian assigns for waiting till the vaginal blood has ceased to flow, is not of so much importance as the other considerations mentioned, yet it is as good a criterion to act upon as any other, because when it has ceased flowing it is reasonable to suppose that the generative faculties have lost their inflammation, and are matured and ripe for procreation.

The effect from a bitch at heat being disappointed of taking the dog.

That bitches do run worse after having been put aside from taking the dog, and for a considerable time, while those who have been put to the dog soon recover after the heat is gone off, and run as well as at any other time, is acknowledged by all coursers. If we consider the state of the bitch, and the direction of her nourishment from her food before the heat comes on, being different to what that direction is while on the heat, and the process going on of giving a proper adaptation for breeding, and its consequent fever and debility, we shall cease to feel surprise at the effect putting her aside from taking the dog has upon her. The aliment, the juices and fluids derived from it, and the vessels employed in conveying them to their several destinations, are directed to different purposes in the two cases, being altered in their direction by the heat, and had settled and established themselves for their new purposes, but those purposes being rendered abortive, a re-action must necessarily take place. Their former action, in the altered direction of their purposes, was in unison with the dictates of nature, yet occasioned irritation, fever, and inflammation; the re-action is from nature being disappointed, and consequently may be termed contrary to its dictates, and must consequently produce an increase of fever to its former, with an increase of inflammation, and its attendant debility; the fluids and organic parts have to be re-directed to their former purposes, and the matter generated towards the ultimate production of milk has to be got rid of by a sort of retrograde movement, evidently by their being so long affected, requiring a length of time.

The matter being thus generated, by not being carried forward in its natural course, becomes, in some measure, indurated, requiring great and long continued efforts to eradicate it, which must occasion a deficiency in energy and strength. What affects one organ, affects the rest of the body, some say by sympathy; we need, however, have no recourse to sympathetic feelings; the blood must be affected by its contact with that affected organ, and in its circulation affects, in some degree, all other organs, especially those of the greatest sensibility, the nerves, for instance; and this obstruction to the regular progress of the matter generated for the production of milk, and the re-action which in consequence takes place, must affect the strong sensibility possessed by the abundance of nerves and lymphatic vessels attached to the numerous arteries that lead to the mammæ, and from them, the blood, affected in its circulation by its contact with them, affects, in its turn, other nerves and all other parts of the body.

Other animals have not their powers and speed put to the test like greyhounds, by which the disadvantage by being put aside from taking the male when in season for breeding, is not so perceptible, nor of so much consequence. The racing mare is evidently affected by it, but not for so long a time as the greyhound; cows, that are in use for the bull only for two or three days, if put by from taking him, are observed to be affected by it for some time; if a fat cow, for instance, comes into use a month or two before she is intended for the slaughter house, she is generally put to the bull, although there is neither a prospect nor intention of reaping any benefit from her young thereby generated; this the feeder does from the notoriety of the fact, that if she is not put to the bull, she sinks in her appearance of fatness very much, and in a short time, which would require a much longer time after the irritability had subsided, to restore her to her previous state.

Cows are affected in this way a shorter time than mares; and mares a shorter time than bitches; the production of their milk is more remotely required than that of bitches, having to go four or five times as long in pregnancy, consequently the preparation of the matter for the ultimate production of their milk, has not proceeded so far, is easier and sooner eradicated from the vessels, and every thing sooner directed to its former course.

The searching qualities of a continued course, for a few weeks, of gentle vegetable purgatives, would assist nature in ridding itself of this indurated encumbrance, and render the bitch sooner fit for the field. This mitigation of injury may be carried further by previous precautions, which may act in the manner of partial preventatives, and thus expedite the remedy. We know that according as is the quantity and quality of food given, so is the surplus of organic particles thrown into the seminal reservoirs, greater or smaller, and all other parts of the aptitude for procreation in like manner, of which the secretion of matter for the ultimate production of milk is one; which matter has to be got rid of before the bitch is in a perfect state for coursing; the less of that matter is thus secreted, the sooner it will be eradicated; and therefore, though an entire preventative, if we knew of one, may be of doubtful utility, yet to make the heat more mild and gentle, and less matter consequently secreted, cannot be supposed injurious, but on the contrary, must facilitate the subsequent eradication of what matter is secreted during the heat. If a bitch shows symptoms of heat, when you do not want her to breed, but to course as soon as you can get her into a fit and proper state, it would be prudent to take her immediately into low keeping, and continue her so during her heat, by which you will have reason to expect a less surplus of organic particles, and less secretion of milky matter in the lymphatic and other vessels. The whey tub is an excellent antidote where much flesh has been given, in which case they will drink more plentifully than without flesh; but in order that they may take in a good quantity of whey when on heat without flesh, which should then be withheld, whey porridge, moderately thickened, would be a good substitute; and if they will eat it freely, would perhaps be the best food with a little bread, to confine them to during the continuance of the heat. I should prefer this gentle diarrhœtic to checking the heat, and preventing nature having its regular course, by giving strong purgative medicines. If, after the heat has subsided, a gentle course of purgatives, besides relieving from the bad effects of the heat, would assist in restoring them to a good state of condition for coursing.

It is the opinion of some coursers, that you spoil for ever a young bitch at heat by putting her aside from taking the dog; and this opinion, I am informed, was entertained by the late Mr. Mundy, for whose opinion I hold the greatest respect. It must, however, be a mere matter of opinion, as I am not aware of any possible means of accurately ascertaining it to be a matter of fact: they may advance instances of bitches never running so well after being put by from taking the dog as they did before going on heat; and may as well say that a middle aged or old bitch will be spoiled for the rest of her life, if put by, as a young one is spoiled by it; but I know numbers of bitches that have been put by both when young and middle aged, that have, in the course of time, run as well afterwards as they ever did before.

In all my numerous inquiries for a practical proof of this supposed interminable injury, I have not been able to meet with any which can be deemed satisfactory. Mr. Hassall's Harpalyse, elsewhere mentioned, was put by from taking the dog, I believe her *two* first heats, and she was generally rather uncertain in her running, which, by some coursers who knew her, was ascribed to that circumstance; but here the proof fails; and the more probable conclusion is, that her uncertainty is more fairly to be ascribed to the march of intellect; a sort of forced march, by which it came upon her with unfortunately running three very severe courses in quick succession when but about fourteen months old, by fresh hares getting up as soon as the other she had been running was killed. What strengthens the proof that her uncertainty was not owing to any bodily defect from being put aside from taking the dog, but to the march of intellect, is, that when she chose to run her best, she showed most extraordinary powers of speed and stoutness, which could not have been the case had her bodily structure been injured by her disappointed heats.

Old Nun, before mentioned, was put by from taking the dog her first heat; and although she has never run in public, yet she has run in many private parties against good dogs; and fond as coursers are of boasting of having beat any celebrated *crack* greyhound, I can find none who claims the honour of beating this bitch. It is curious, the uniformity of answer I have received to my inquiries on this subject: "What Nun?" they say, "Yes, Mr. Hodgkinson's Nun;" "No! no! I cannot say I have—she is a good one," they generally add. I am, however, now relieved from this difficulty of finding any courser who claims beating her, as a very good friend of mine, who has a stud of good long tails, claims the honour of having beat her, the last season, when she was *ten years old;* aye, and boasts no little of it, of which I am very proud, as if he did not think her a very good one, he would not think it worth while boasting of having beat her when ten years old by a middle aged greyhound.

Although Mr. Mundy entertained the opinion of such eventual injury from putting a bitch at heat aside from taking the dog, he was nevertheless so convinced of the injurious effect in other respects from breeding at that age, that he never, in such cases, allowed them to suckle more than one, or at most, two whelps, and those not to hang upon her the usually full time.

Now there is the *questionable fancy,* nevertheless very important if true, that of the young bitch being spoiled if put by from taking the dog, on the one hand, and *the unquestionable fact* of putting her to the dog at that age, preventing the full and perfect development of her muscular and bony structure, on the other hand; the bitch's services in the field during that period are worthless either way, with the exception of three or four weeks; but as we know that where a number of bitches are kennelled together, when one goes on heat, all or most of the others do the same; and we know also, from a variety of facts, that excitement has great influence in these cases, there seems no other preventative against this dilemma, than keeping those you think too young to breed separately from the older ones, when there is any probability of any of those old ones going to heat. Even should a young bitch go to heat without this excitement, and in a way which may be deemed a natural heat, I would, if I valued her future services either to course or breed, put her by from taking the dog; as I conceive the injury arising from putting her to the dog, to be much greater than whatever injury may follow from disappointing her.

I know some few instances of young bitches going to heat that have been bred from parents that were of full age when they first bred puppies, and I do not doubt that many instances may be adduced of such being the case; but in those few cases which I know of, there is great reason for supposing, that such early heat was more from being with other bitches when on heat, than from a natural or unforced heat. On the other hand, I know many instances where those bred from parents which did not breed when young, have gone two or three years without being on heat, although they have been with other bitches on heat generally from the time they became old enough to course; and it may be questioned whether the safest and best way of preventing young bitches from going to heat, from which there is so much disappointment and injury, would not be to breed from none but those of quite a full age.

I know a bitch that is now suckling her first puppies, and from her first heat, and she has run two seasons, if not three; she was with another bitch that was on heat and bred from it, a year before she came on heat herself, and they thought she showed signs of it at the same time, but it did not come forward, though she was with the other bitch in a small kennel all the time. This bitch, I have only recently found out, was bred from quite old parents, and her parents also bred from old ones.

One or more wardings.

It is a question with some breeders whether, by having less than an average number of whelps at a litter, they have not a right to expect those whelps will eventually make better dogs than if there were more of them; this question is distinct from that of how many, if the litter be numerous, it is best to let the dam suckle; as the latter question is dependant, principally, on whether the dam is a good suckler, has a deficiency of milk, or is herself in good health, and well or ill fed, and assisted by the puppies, when old enough to lap other milk, having the proper attention paid to them; while the former question is dependant on there being a good supply of generative matter, and that in a fit and proper state, from both sire and dam. If a mare brings forth a foal, or a cow a calf, not above half the ordinary size, the breeder would at once conclude that there had been a defect in one attribute or another in producing it; why, therefore, may we not conclude the same, if a bitch only brings half the average number of whelps?

If there be much disparity in the number of each sex produced, it shows some, though it may be a trifling defect, in either the quantity or quality of the matter in the opposite sex, but which, when the litter is numerous, is of minor importance, as upon the whole there must have been a sufficient abundance in both parents, and they in a fit state for procreation; but without any great disparity in the number of each sex, if the number of whelps be much under the average, it shows a material defect in one or other, or both of the parents. This defect cannot be fully counterbalanced by those few puppies having a greater share of nourishment in the womb than if there had been more of them; an average number is the best, and the most promising to make good greyhounds, and those about an equal number of dog and bitch puppies; for where there are many more than an average number, there must be some deficiency of sustenance for them, and the womb distended and uncomfortable, like an over-filled stomach.

Less than an average number is not only dependant upon the stage of the dam's heat, the general health or condition of both sire and dam, but also dependant on the number of times they are put together, and that of the dog having, or not having, recently been put to other bitches, and how often.

Amongst Buffon's numerous experiments and examination of the semen of dogs, he caused two emissions from one dog in the same day; in the last emission the fluid was not only less in quantity, but also totally unsupplied with the essential organic living particles, of which, in the first emission, there was abundance.

These particles, he found by other experiments, are secreted in the body of the animal, in the flesh, and in the flesh of the testicles, and when the reservoirs are discharged of them, they require a certain time for renewal, and fresh seminal fluid is found long before the particles are found in it. Thus putting the dog repeatedly to the bitch, unless a proper interval is allowed, is devoid of any utility in causing a renewed impregnation, because the fluid of both dog and bitch, by that repetition, is without any of the essential abundance of the organic particles which constitute the seed.

This matter is subject to some variation in different animals, and also a variation in the dog, according as he is fed in quantity, and the nature of the food; a horse, bull, or ram, would effectually serve his respective female more times in a day than a dog, especially if the dog were fed only once in a day, a full meal, and the food be all, or nearly so, of the same degree of digestibility. The food, before it contributes to supplying the seminal reservoirs, has to undergo its process of digestion, chymification, chylification, and animalization; which latter consists of the nutritive particles penetrating into the organs, and becoming a part of the animal himself; the perpetual waste of the flesh and parts is then re-supplied by the nutritive particles penetrating into the organs, and therefore it is that the food should be such as re-supplies that perpetual waste by fresh additions in the same order or progression with which that waste takes place; the nature and digestibility of the food best calculated for this progressive action and corresponding re-action, according to the respective organization of each animal, is that food best calculated to support his strength, which corresponds with his entire organization; it will not be doubted, that what is most corresponding to the organization of any animal, is the best for him.

* This applies to his powers of procreation equally with those for labour, or for his greatest possible exertion; and is the principle which ought to be acted upon in feeding greyhounds when in training for the course.

When the food has undergone its animalization, any surplus nature finds in the organs is extracted and directed to the seminal reservoirs for procreation; then, if only one meal in a day be given to a dog, and the food nearly all of *one* degree of digestibility, its nutritive particles enter the organs nearly all at the same time, and the organic particles are supplied to the seminal reservoirs, in a corresponding manner; but if that one meal in a day be of food of *different* degrees of digestibility, (of which the most natural food for a dog, and the most corresponding to his organization consists,) the nutritive particles penetrate the organs progressively, and the organic particles are directed to the seminal reservoirs in the same order. If only one meal in a day of the same degree of digestibility has been given, and the organic particles have been accumulating for many days, there will be such a superabundance of them in the seminal reservoirs, as may serve for more than one copulation, yet the greatest portion of them are discharged in the first, except from the more remote reservoirs; the approximating reservoirs are only partially recruited, and that by the remote ones, until the succession of particles from the day's food succeeding that from which those particles were derived.

The same is the case with the female, when the same male and female are repeatedly put together; yet by excitement, a fresh supply of seminal fluid may be attracted to the reservoirs by a sort of forced extract, but which is not attended with the essential abundance of organic particles, nature not having had due time for its required decomposition by its commixture with fluids from all parts of the body, which is essential to the re-production of those particles. If, therefore, the dog be fed only on one meal a day, the food ought to be of various degrees of digestibility, the digestion of different substances being accomplished on one substance some hours before that of another; but if his food be all of one degree of digestibility, he ought to be fed several times in the day, to keep up the required regular supply of nutritive particles to the organs, either for the purposes of procreation, or of supporting his strength during long continued exertion.

The horse, bull, or ram, with food before him, though that food is nearly all of the same degree of digestibility, feeds almost perpetually, and the sustenance comes into the system progressively in its order as taken into the stomach; furnishing, from time to time, a fresh supply of nutritive particles in regular course to the organs; therefore it is, that the males of some sorts of animals will effectually serve females more frequently in the day, than the males of other sorts of animals will do. Horses, bulls, and rams, will serve their respective females oftener in a day, than a dog that is fed only once a day of food of only one degree of digestibility; I know of two instances where a horse has effectually served six different mares in one day. It is thus that a cow, after being milked in a morning, continues gradually filling her reservoir, or elder as it is called, with fresh milk until her next regular time of milking, not from the food she eats that day, but the day or night preceding it, because she is continually feeding. It is thus that a horse's strength is successively supported during a great and lengthened exertion for the ten or twelve hours he may be absent from his manger when hunting, or employed in other severe work. It is the same with the greyhound; his strength is better supported in his courses, if he is fed in such a manner, or with food of different degrees of digestibility, to come progressively into his system, than if it comes nearly all at the same time; his stomach will feel exhausted for want of some food in it to act upon; and if his stomach feels exhausted it will affect his whole frame in some degree.

Food is digested a considerable time before the nutritive particles fully and finally penetrate into the flesh and system, so as completely to renovate it. A man scantily fed, and of poor food for several days, has but little desire for sexual intercourse; give him one good substantial meal, at noon for instance, his desire *may* come on at night, but not to so great a degree as it will the next morning.

If you put a bitch three or four times to the dog during one heat, the produce, in all probability, is all either from the first or from the last warding, and not from the intermediate ones; otherwise, when a day or two intervenes between these wardings, why do the puppies come generally all at one time, in one day, or in one night? The immediate agency for this is not exactly known or defined by philosophers; but I should be inclined to think the puppies are from the first instead of the last warding; especially if the bitch were past the meridian of her heat when that first warding took place; and if but few puppies are produced, it is owing to part of the first impregnation being destroyed by the subsequent wardings.

The bitch ought to be, what is termed, *close warded;* that is, be allowed to hang together their natural time, without means being taken to separate them, as is sometimes done by dashing cold water upon them, or otherwise; as nature has given that peculiarity of structure, we have every reason to conclude that there is some other peculiarity in their organization, which renders their hanging together more necessary in them than in other animals, against the loss of the seed, while an important duty is performing towards the full and final impregnation of it.

Magendie, Provost, Dumas, and others, have ascertained that the full and final impregnation and union of the male and female seed, or the first formation of the miniature fœtus, is not complete for several days after the meeting of the sexes. Buffon's theory on the subject is in unison with what these physiologists have ascertained by experiment. The organic particles, as before observed, are governed by the laws of affinity and attraction; those from the head of the parent cannot take their seat in the leg of the fœtus, and the same by the other parts; yet the particles from the different parts of both male and female are common to each other, and those from the arm of the male will unite with those from the arm of the female, in forming the arm of the fœtus; the same by all the other parts, except the sexual parts, which do not give the same formation in one as in the other sex, therefore they do not unite in the formation of the sexual parts of the fœtus, not being common to each other. He therefore supposes that the sexual parts of the fœtus are those which are first formed, and according as the particles from those parts of the male or female are of greater abundance, or more powerful than the other, so is the fœtus a male, or a female.

Meanwhile, the organic particles of the other parts of the body, are floating in the volume of seminal fluid which surrounds the new formed sexual parts, and assemble, by their affinity as they are attracted, and unite those from the male with those from the female, according to the organ from which each particle is derived, in their proper rotation.

Some time must necessarily elapse in the progress of this union or impregnation of each several part, and the concentration of the whole, and their subsequent germination, which, in the first instance, is more properly a vegetation than a growth. As the uterus opens, and draws in the semen by aspiration and directs it to the ovarium, it then closes upon it, secures, and presses it, as the healthy stomach, by the contraction of its muscles, closes upon and presses the food taken into it, assisting the digestion of it, as the other assists the impregnation and germination of the seed.

If the warding is repeated, especially on the same day, when the reservoirs may not be replenished with a sufficient abundance of animalcules, or even of several days, which it appears is required for the impregnation to be complete, the uterus must again open its orifice to admit the seed; by doing which, the former contraction of its muscles must be relaxed, consequently the folds open and expand, and the progress of the germination of the former seed be disturbed in its position; and there can be nothing more likely to interfere with or prevent the completion of the impregnation, than an introduction of more of the same kind of matter to it; it matters not whether it is an animal that generally only produces one offspring at a birth, as a cow, or a mare, or whether there are many at a birth, as a bitch, or a sow, the impregnation must be interfered with by a fresh opening of the orifice of the uterus, and an injection of more matter into it, either by the position of the new developing individual being disturbed in an only partly formed state, or the opening and expansion of the folds of the uterus, as the whole must necessarily be agitated and disturbed by the operation of a second conjunction of the sexes.

A second warding may destroy wholly or in part, the effects from the first; it may, it is true, cause an additional impregnation, but the probability is, that it will oftener endanger both, than secure a portion of either; the second may destroy the effect from a greater quantity of seed, both male and female being fresher in the first than in the second warding, to give effect to a smaller quantity of seed. The impregnation cannot be considered safe until the male and female particles are combined and united, and the vegetation of them has begun to germinate, which, it appears, requires several days to complete the operation. For these reasons we need feel no surprise at common prostitutes so seldom breeding.

The same effect will not take place alike in all cases, because there are different degrees of perfection or imperfection in the aptitude for procreation, in both sexes. If both male and female are in the most perfect state, the perfectly healthy organic particles of each, will have a much stronger affinity and attraction to each other, than where there is a want of that perfection in the several attributes; consequently they will adhere more closely, and not be so easily separated when once they begin to unite. Thus, in one case, a second warding may partly or wholly destroy the growing effects from the first, and cause no new impregnation, but render the whole abortive; while, in another, it may not injure the first impregnation in the least, and cause an additional one, which may produce an unusual number of whelps. Even an increased number from a second warding is not desirable, as long as the first warding, under those circumstances of perfection in both sexes, being probable to produce, at least, an average number, that would have every prospect of being well nourished both before and after birth, which much above an average number would not have; or one warding, where both sexes are exceedingly ripe in every respect, and have an excess of matter, may produce an unusual number of whelps; or in those animals which are expected to produce only one offspring at a birth, may, under these circumstances, produce two or even three, as women have twins, and, in a few instances, three or four; or cows in like manner; I saw three fine bullocks or heifers, of Mr. Brewster's, of Radcliffe, near Nottingham, that were produced at one birth, and were, if I recollect right, sold to a butcher at Birmingham for one hundred pounds when three years old. Such variety of contingences attend breeding, that there need be no surprise at the difference we observe in the produce under the various circumstances; but I am convinced that the main principle which governs the operation of nature in breeding is as stated in the foregoing pages. Under all the circumstances, an average number of whelps is the most likely to prove the best greyhounds.

Some dog breeders make it a rule, when they have both dog and bitch intended to breed from, in their own kennels, to put them together, no others being with them, as soon as the bitch shows signs of the heat, and let them remain together, under no other than their own control as long as her heat continues. This is something like animals breeding in a wild state, but not so good a system as in that state; there, the master males, which are the most powerful and courageous, will generally keep the other males from the female in use; but it amounts to no proof that it is the best way to put them together in this way, that the bitch may be warded as often as she and the dog can agree in their courtship.

Now I know a recent instance of a dog and bitch being put together apart from any other, and she produced eleven whelps. Her owner *supposed,* when he informed me, that the dog warded her four or five times; one servant said three times that he saw them, but his account of whether those were fair wardings did not appear to me satisfactory; another servant, (and he has the principal care of the greyhounds,) *thought* not above twice; but both agree that they were at the latter period of her heat. I was very particular in my inquiries, but so little importance do they in general attach to this matter, and of course were less particular in their observation of her wardings, that I am inclined to think that the dog did not ward her above twice, and even doubt if more than once.

It is a general opinion that if they be put together all night, and left to themselves, that the dog will only ward her once during the night; the same rule may apply in principle to his being with her many days and nights, and it applies much more strongly in this instance than in many others, as this was a very old dog, so much so that, though a favourite, which his owner would not part with on any terms to others, yet being so old as to be useless for the field, he had him destroyed very soon afterwards, before these whelps were pupped. We know that, generally, the bitch will not take the dog at the early period of the heat; that she is very snappish in the middle of the heat; that many dogs are shy under these circumstances, and will not bear biting, but keep aloof and remain quiet. Being a very old dog, yet having had no bitch for some time before, he would have abundance of animalcules in his reservoirs, and it is nowise surprising that he produced eleven puppies, when we so often find that twelve are produced with once warding; at the same time that once warding would satisfy and quiet him for a much longer time than it would a young or middle aged dog, and he would be a much longer time before he had a renewal of sufficient abundance of seed to stimulate him to a fresh warding; being with her all the time he would be less likely to attempt it, than if he had been separated for a day or two, and then put to her again.

The same gentleman, shortly afterwards, had another bitch on heat, which he put to a younger dog, and it was known that he warded her three times in the same day; but she produced only five whelps, which appeared to puzzle the parties; I should have been less surprised at her producing *none* than only five, and very much surprised if she had produced *twice* five.

Any imperfection whatever in any faculty of either male or female will cause an imperfection in the offspring in a greater or less degree, according as any of the variety of circumstances which are attendant upon it are the more or less preponderating over the other; and nothing is more subject to this variety than re-production, or more difficult satisfactorily to define. I have, while this sheet is printing, been informed by a respectable person who knew the parties a few years ago, of a very singular circumstance; that of a deaf and dumb man being married to a deaf and dumb woman, both having been so from their birth. Some of their children are deaf and dumb like their parents, others not to such a degree, and one of them has no defect whatever in that respect. Neither of the grandfathers or grandmothers of these children had any defect of this nature, nor any of their relatives; so that there was no defect of that nature in the blood, or in the breed as some term it, and it must therefore arise, in the first instance, from some defect either in the general health or proper aptitude for procreation belonging to those organs which are produced in a defective state; the latter is the most probable; one faculty has a preponderating influence over others at one time, while at another a different faculty preponderates over the former one, from which arises all the diversity of features, shape, intellect, and so forth, that we see in the same family. Thus, an apparent perfection will sometimes produce imperfection; and the most rational conclusion is, that such imperfection results from an unfit aptitude for procreation. When that imperfection is once produced and established in the breed, it will continue to affect the future offspring, although a latent perfection remains in the breed, which will at another time have a preponderating influence, and may produce a perfect offspring. Similar to this is the different colours of greyhounds; one resembles sire or dam; another grandsire or grandam, or great grandsire, and so on for many previous generations.

This reminds me of an anecdote, which would be improper to introduce into some publications; but my unwillingness to advert to females of the human species, and the general matter in this chapter necessary for a proper consideration of the subject treated of, have been over-ruled by one of my professional friends observing to me, that this work ought to be such as is not perfectly suitable to a lady's drawing-room, but to be for a gentleman, or a sportsman and breeder's library; and as this anecdote is a practical illustration of my argument in the foregoing pages, it may be admitted without impropriety, and with it I will close the chapter.

A gentleman in Manchester was married when little more than twenty years of age to a lady about the same age; for several years they were not blessed with any offspring from their union. Being both of them healthy, strong, and of good constitution, they did not know how to account for it; and being desirous of offspring, the husband had recourse to the advice of a professional friend on the subject. This, after the necessary inquiries by the medical gentleman (I know not whether he had studied Provost and Dumas) was answered by a recommendation to abstain from his usual frequency of intercourse with his wife, and confine himself to once a week. This advice was followed, and the result in due time was a fine boy. A further increase of family succeeded to this each succeeding year, until the husband, approaching forty years of age, began to think that his family would be too numerous for his finances, and consequently again applied to his medical friend for advice upon it, who recommended his returning to his former frequency of intercourse. "Oh!" said he, "I have thought of that myself, and tried to do so, but find I cannot; that day is gone by with me." "Well, then," said the doctor, "you have only the choice of one of two alternatives; either to submit to a further yearly increase of family for some years longer, or to abstain altogether from further intercourse with your lady."

Under this, and other circumstances before-mentioned, it is evident that once close warded is better than repeating it; and that such warding should be at the last period of the heat, say, for instance, two days before the heat would be gone off. The stopping of the vaginal blood is the best criterion to go by, as during its flowing there is every reason to conclude that the operation is going on to produce a proper state of aptitude for procreation, and consequently that when it has ceased to flow, such aptitude is arrived at its perfection. From this system, therefore, you have every reason to expect as many whelps as you can desire, and that they will eventually make the best greyhounds.

DISTEMPER IN DOGS.

THIS disease, so frequently fatal, is a most formidable enemy to encounter, and as I am not provided with any infallible remedy amongst all the variety of infallible remedies that are put forth, but which often prove very much the reverse, I shall not say a great deal about it, but content myself with giving the best remedies I have been able to collect.

In the first place, a brief abstract from Mr. Youatt's Lectures in the Veterinarian, for January, 1830, by a perusal of which lecture the various and most early symptoms will be found therein most ably explained, and which are very essential to be attended to, as taking the disease in its most early stage, is the best security against its proving fatal.

He says, "On the first appearance of this comparatively new disease, for want of a specific name, they called it on the Continent 'La Maladie des chiens,' the disease of distemper in dogs. English writers, sixty or seventy years ago, make no mention of it; since its becoming common, they say it was imported from France; but French authors affirm it to be of British origin."

The different heads under which Mr. Youatt explains it, are briefly, that "dogs of all ages die of it, oftenest from the sixth to the twelfth month; will occur two or three times in the same animal, the second time milder, the third time fatal. It is contagious, generated, hereditary, epidemic, and endemic; oftener occurs in spring and autumn than in winter, and much oftener than in summer; whatever debilitates the constitution, pre-disposes for the reception or generation of it. Inoculation used to be recommended as producing a milder or less fatal disease; but so far as my experience goes, the contrary has been the result. It varies in the form it assumes, and varies in different breeds; the shepherd dog is the least affected by it; next the cur; then the terrier, especially the white terrier; then the hound; then the setter; then the small spaniel; then the greyhound; the pug; and worst, the Newfoundland. A foreign dog attacked is almost sure to die of it; the delicate Italian greyhound has but little chance. It is a truly Protean disease; emetic, the natural medicine; feeling ill, a dog flies to the dog grass, unloads his stomach, and is at once well. The intestines are found almost filled with worms; the mucous membrane seems to be the seat of the disorder. The golden rules are, abhor all specific nostrums; suit the medicine to the symptoms; feed well; keep quiet, and tolerably warm; do not imagine the dog to be well before he is; and do not expose him to the danger of a relapse. All violent exercise to be scrupulously avoided for at least a month after he appears to be recovered; good feeding the best preventative; a growing dog to have nearly as much as he will eat; the distemper will try the strength of the best conditioned animal; a half starved whelp is sure to perish. Inocculation appears favourable when the season proves so; at other seasons the distemper carries off the majority of those supposed to be exempt from the attack."

There are some dog doctors who pretend to be in possession of an infallible remedy for it by an outward application, without administering any internal medicine; they say it attacks the head, and an obstruction takes place, which, by producing a copious discharge from the nose, relieves them, and they will recover in four-and-twenty hours, if taken as soon as any symptoms of it appear; and if almost dead, two dressings will cure them; this remedy appears to be horse turpentine and tar, rubbed all over the muzzle, each separately, some of which the dog will lick into his mouth, and will assist in relieving him; also rub some up his forehead and on the top of his head, keeping clear of the eyes, and also under his jaws; this *infallible* remedy, however, failed in a valuable and high bred greyhound puppy three or four months' old, that had been dressed twice or three times with it, for it died.

Mr. Flindt, surgeon, of Buxton, who breeds and rears many pointers and setters, says he has never lost a dog by the distemper since he has used the following remedy, when taken at its first appearance. Two grains of calomel, with three grains of Dr. James's powders, mixed with butter, every morning fasting, six times; a seton, six inches long, on the back of the neck, and diet with strong broth.

Dr. Teulon has known some very bad cases cured by Sub-Sulph, hydr. (turpeth's mineral) as much as will lie on a sixpence, for an aged dog, or on the point of a penknife for a puppy, given in butter, and repeated in two days, if necessary.

Mr. Harrison, of Risley, near Derby, says he never lost one since using the following means; by giving the dog two large tea-spoonfuls of common salt in a ball of butter, and leading him about till he vomited, and cleared his stomach from slime; afterwards, by giving ten grains of calomel, and twenty grains of emetic tartar, made into a bolus, and divided into twelve equal portions, one to be given every morning fasting. A seton between the cheek bone and neck, if dogs are bad, relieves the head: and if they are not very young and weak, he takes a little blood from them at the time of giving the salt.

Mr. Benjamin Towle, of Borrowash, near Derby, had a setter attacked with the distemper, at the beginning of the shooting season, which was so bad that he feared if he got over it, some months might elapse before he would be fit to work; he had been bad four or five days, almost blind, with froth and filth about the nose and mouth, a husky cough, and he could scarcely walk; at which time he accidentally met with a receipt, " a meat-spoonful of common salt dissolved in three of warm water, and given quite warm to the dog," which he administered to the dog, and it made him vomit almost immediately, and purge soon after; the next day he appeared much better, and in two days after he gave him a stronger dose of it, and in less than a fortnight the dog was completely recovered and fit for work.

I have since then seen instances where salt has a stronger and more immediate effect given in warm water than in cold. Mr. Harrison was informed of the above case, and on his return home, he found a small spaniel lying on the straw in the yard, nearly blind with distemper, and in almost a lifeless state; he gave him salt and warm water, which caused him to vomit instantly, and also to purge, and to his surprise the dog was well in two hours afterwards. Even this remedy I have since then known to fail, and am inclined to think, with Mr. Youatt, that the best way is to suit the medicine to the symptoms.

I. G. Copestake, Esq., of Meynell Langley, recommends a clove of garlick as soon as perceived by running at the eyes, and a repetition of it in two or three days, and has never known an instance of its failing. Mr. Michael Hallam, of Derby, recommends in a month or two after the puppies have left the dam, and repeated occasionally afterwards, a meat spoonful of grease or fat from the kell of a goose, which causes them to vomit, and also acts as a mild purgative, and I should think would be a very useful preventative; but he says he has cured those which were very bad of the distemper, with this fat from the kell of a goose, without any other medicine.

Worms are evidently connected with the distemper, as Mr. Youatt says the intestines are found almost filled with them; and some people think that the disorder originates with worms. But worms must have an origin, and I have no doubt but that they are very often generated from the foulness of some food they eat, though they may be engendered by weakness from other causes; milk, except warm from the cow, given in its cold raw state, is very subject to give young puppies the worms, and should be boiled before it is given to them; giving occasionally an emetic, and keeping their stomachs free from slime and impurities, will assist in keeping them free from worms.

Mr. Youatt says, the best emetics are common salt, or calomel and emetic tartar, from half a grain to a grain of each, according to the age of the dog. For worms, he recommends tin filings, or powdered glass, from half a drachm to a drachm of either, twice a day; Digitalis, James's powder, and nitre into balls, with palm oil and linseed meal; two or three emetics, one every other day, and a ball morning and night, the intervening days. He recommends other remedies for worms, as powder of tin or pewter, a drachm, Æthiop's mineral twelve grains, repeated every second day, keeping the dog warm; calomel, aloes, and antimonial alteratives; after them, the lozenges of Lichen Islandicus; a meat-spoonful of spirits of turpentine, mixed up with flour, and a spoonful of sirup of buckthorn, made into four pills, and two given each morning.

I have reason to think, that the mucous membrane is the seat of the disease, as Mr. Youatt observes; and when it is generated, that is, not by contagion, to keep the blood as free as possible from impurities, is the best preventative; nevertheless dogs should also be well fed, and kept as strong as they can be; but where it is from contagion, epidemic or endemic, to keep the blood free from impurities, is the best preventative against their being predisposed for the reception of it. It may be some time in progress before it is perceived, nature has been struggling against it, and thereby is weakened, and being less able to withstand its effects it ultimately gets the upper hand; it then shows itself about the head of the dog, and to relieve the head a seton or anything which causes a copious discharge from the nose must be of benefit. Dogs do not throw off superabundant matter by the skin, it must therefore be got rid of by the general outlets, either by exhalation or evacuation, as by vomiting or purging.

The corrupt matter generated by the affection of the mucous membrane, appears to determine itself principally towards the head, and probably in such quantity that it cannot get a free passage; by its obstruction and accumulation in the avenues of the head it may become, in a degree, indurated, so much so, as even to cause a partial obstruction to the circulation of the blood. I conceive some light would be thrown on this by the dissection of those parts in different stages of the disorder. I am the more inclined to think that the disorder acts in this way, from the evident relief very often given by a seton on or near the head, and I know a bitch that was so very bad it was thought she would die, a seton was the last remedy applied, and she began to get better soon after it began copiously to discharge matter, and she eventually got well.

To lay the foundation of good constitutional health and strength is the best preventative against the distemper; to do which you must begin with sire and dam being of good constitution, and healthy at the time of breeding; it is said by some medical practitioners that the small pox in children is from the corruptions engendered in the blood of the mother, for while in the womb the natural outlets are closed, and the impurities become fixed in the blood till after birth, when nature tries to rid itself of the encumbrance by the channel of this disease. To prevent this they recommend purifying the blood during pregnancy. Whether the distemper in dogs is anywise analagous to the small pox in the human species or not, I will not pretend to determine; but the principle best to be acted upon, so far as a preventative, or a mitigation of its effects if attacked, in the first onset of their becoming living beings, is analagous one to the other; and the idea is worthy of attention, for if their blood becomes fixed with impurities in that stage of their production, the best feeding possible after birth will not eradicate it; and, on the other hand, to purify the dam's blood by moderate purgatives during pregnancy, cannot well be attended with any bad consequences; after birth the dam would not require purgatives either for her own health or that of her puppies, especially if her blood were before cleansed from impurities; women are never more healthy, more free from taking cold, free from headaches, and other complaints, than they are while they suckle, because any impurities in their blood are conveyed in the milk to the infant which she suckles; so it is with the greyhound bitch while suckling her whelps, as we may perceive by her losing her flesh when they get strong, and require all the milk she can give them; for although she then eats a greater quantity of food than at other times, and much oftener, the nutriment is not sufficient to supply the ordinary waste which has before been alluded to, as always taking place; she sinks in flesh, though taking in a much greater supply of food; consequently it is obvious that the greatest part of the aliment is converted into milk; and if the aliment be from food that is raw and foul, or if her blood, which is the agency of conveying the aliment to the mammæ, be previously full of impurities, that foulness and impurity are conveyed to the young while in the womb, or after birth while sucking. As preventatives are acknowledged to be better than remedies, and as in this case, we know of no certain remedy when violently attacked with this virulent disease, so would this harmless purifying of the blood be the first step, and the most probable means of preventing it, and more especially if followed up by occasional purifications afterwards, until their strength and constitution were more perfectly established than it is when very young.

For this purpose I am partial to vegetable, in preference to mineral, purgatives; mineral purgatives are said to corrode the bowels, and sometimes leave an interminable injury; while vegetable purgatives, being congenial to the nature of the animal, have no such injurious effect; the bowels are never weary of them; the animal will grow fat under their operation, and may be taken for a length of time with less liability to injury from taking cold, than when those humours which they purge away are in the blood. Calomel is thought to act as a kind of mechanical purge solely in the intestines, which it partially cleanses, and thus gives temporary relief; but being uncongenial to the system, nature endeavours to prevent its entrance into the circulation of the blood. Vegetable purgatives, however, being in their nature similar to food, digest, are carried into the circulation, and being thus enabled to search every part of the body, bring any superabundance or impure quantity of bile, or other fluid, into the bowels, where it is discharged without the violent irritability produced by mineral purgatives.

If a moderate dose of these vegetable purgatives were given once every week or ten days during pregnancy; the milk boiled before it is given them, and any flesh they have, moderately cooked to get rid of the raw, foul, watery and heavy parts, both during pregnancy and while suckling, it would pave the way for the puppies being afterwards healthy and strong; less pre-disposed for the reception of the distemper, and more able to contend against it if attacked.

I had an instance of puppies being affected in the same manner as their dam was, which very much strengthens my conviction of the necessity for purifying the dam's blood both previous to and during pregnancy. I let a friend have a favourite bitch to breed from, and to divide the puppies between us; before she went to heat, some dislike to greyhounds was expressed by the gude wife, and they were all disposed of, and my bitch sent home; but this dislike to them seems to have prevented them being fed in any sufficient manner, for a more miserable, thin, lean, three-parts-starved creature never was seen than she was when she came home. I know not how to account for the state she was in afterwards, than by supposing that a surfeit or some other disorder was brought on by being too suddenly forced with good food to bring her into decent order, as, for a week after, she was fed, I may say, to excess. She became unwell, from which, in a few weeks, we recovered her, and she came on heat and was put to the dog and produced eight whelps; her looks in the mean time were meagre, and most of her hair came off; the whelps did very well till nearly the time of weaning, after which nearly all their hair came off in the same manner with that of their dam; one was accidentally killed, one I reared till four or five months old, and then gave it to a friend; it is now about twenty months old, and promises to be a very good one; all the others died, having scarcely any hair on their skins, and all of them apparently of the same sort of disease with which their dam was affected, and from which she was a long time in completely recovering. I may therefore ask, if these whelps were affected by the state of their dam in this particular instance, which was clearly and evidently the fact, why are not other whelps affected by the state of their dam being healthy or unhealthy from whatever cause? Although the different dams may not be affected to so great a degree as was the case in this instance, yet if they are affected at all, it must affect the whelps in a corresponding degree, and in the same degree pre-dispose them for the reception of the distemper; to avoid which, purifying the blood must be the first and primary step taken, and the most advisable to be done, although the bitch may be in an apparently healthy state.

REARING.

Unto thy choicest friends
Commit thy valued prize; the rustic dames
Shall at thy kennel wait, and in their laps
Receive thy growing hopes, with many a kiss,
Caress, and dignify their little charge
With some great title, and resounding name
Of high import.—*Arrian Translated*, p. 150.

THE rearing of greyhound puppies is perhaps the most important branch in the whole system of kennel management; without it, the best blood, the best shape, speed, strength, or stoutness, in sire and dam, and the best possible training when old enough to course, is thrown away, and of no avail in bringing them to run with success in the coursing field, or repaying the breeder for all his anxiety, attention, and expense for that purpose, from the beginning to the end.

The first few weeks after leaving the dam is perhaps the most critical time during their growth; weakness, engendered at that period of it, whether from want of a sufficient quantity or congenial quality of the food at that tender age, or being confined, and from want of room to take their own natural playful exercise to strengthen their parts, is almost certain to lead to decrepitude and deformity in one shape or another, and the weakest born puppies will suffer the most from it.

The food that is given to them should be such as is congenial to their age; and in all changes of food as they become older, the transition from one sort of food to another should be gradual; the more tender their age, the greater is the nicety required; attention should be paid to this even while they are suckled, and under the care of their dam; for although she may have plenty of milk, which of course in some measure depends on how many whelps are allowed to hang upon her, yet a too sudden transition from the warm, sweet, mother's milk, to cow's or any other milk, or other food, is sure to make them fall off in their looks and freshness of flesh, and to check their future growth. Milk of cows, or of any other animals, when drawn from the teats, is warm and sweet; as it gets colder, the sweetness goes off, the cream rises as the particles separate, and when once separated, they will not unite again into their original and pristine state, even if you warm, and agitate it over the fire; this changes its united properties differently from what they were when first drawn from the teats; boiling it also alters its properties, but boiling it under some circumstances, is beneficial.

If you make cream cheese, such as is generally termed so, although only made of new milk, it makes a material difference in the flavour and richness of the cheese, and its proneness to get ripe, betwixt being put together warm from the cow, and being put together after it has once got cold, though you warm it to its original heat; this I know to be a fact from experience, of the cow being near home, so that you can put the cheese together immediately, or her being at such a distance that the milk has become nearly cold when brought home. The effect from this alteration in the properties of milk, is particularly applicable to whelps during the time required by nature to receive their sustenance from their dam; and whether the whelps in a litter be numerous or few, or whether the dam has a plentiful supply of it for them or not, an attention to this alteration of its properties, will be found useful in promoting the growth and health of the young and tender whelps, and in assisting or easing the dam by additional sustenance from the cow.

Magendie says, "The milk is one of the most azotised glandular liquids; its colour, odour, and taste are known to every body; according to M. Berzelius, it is composed of milk, properly so called, and of cream.

Milk contains—

Water	928,75
Cheese, with a trace of sugar	28,00
Sugar of milk	35,00
Muriate of potass	1,70
Phosphate	0,25
Lactic acid, acetate of potass, and lactate of iron	6,00
Phosphate of lime	0,30

Cream contains—

Butter	4,5
Cheese	3,5
Whey	92,0

In this last 4,4 of sugar of milk and salt is found.

It has been long since observed, that the quantity and nature of milk change with those of the aliments; and this fact gave rise to the singular opinion, that the lymphatics were the vessels intended to carry to the mammæ the materials of their secretion; but the milk, like the urine, varies in its properties according to the solid or liquid substances introduced into the stomach. For example, the milk will be in greater abundance, thicker, and less acid, if the woman has been fed with animal matters; it will be less abundant, less thick, and more acid, if she has made use of vegetables. Milk assumes peculiar qualities if the woman has taken medicinal substances; for example, it becomes purgative if she has used rhubarb, or jalap, &c."

Arrian says, "Mothers' milk and breath are cherishing to their puppies." That mothers' milk is the most congenial food for them, no one will doubt; but the benefit from her breath is the external warmth which it imparts to their bodies, as inhaling her breath is prejudicial, as will be more fully seen hereafter. But in case they cannot have mothers' milk, how far Sir Thomas Elyott, Turberville, and others, are right with respect to nurse bitches, may admit of a doubt, at least so far as the nourishment to their bodily strength applies.

The milk is a provision of nature for the sustenance of the young after birth to a certain age; but the same Providence which provides natural sustenance for the offspring, by furnishing the parent with milk wherewith to suckle and nourish them, also provides substitutes for such milk in case the offspring should unavoidably be deprived of their natural aliment; and substitutes there are which are known to bring up greyhound puppies to be as good, or nearly so, as those which are fostered with the milk and breath of their dam, even if no nurse bitch either of their own or of a mongrel species can be obtained.

If you feed them with cow's milk, it is necessary, while they are very young, in such cases as being deprived of mother's milk, when only a few days, or even a month old, that some additional nutriment besides the milk should be given; a cow feeds wholly on vegetable substances; whereas a bitch feeds, or ought to feed when suckling whelps, partly on animal substances; we find, from Magendie, that the quality and properties of the milk vary according to the nature of the substances taken into the stomach. Sugar, or flesh tea may be added with advantage: I know of two instances which show the benefit from sugar, or, I might say, its indispensable necessity where deprived of warm mother's milk when so very young, in two foals of the heavy draught kind; milk, we see by the analysis, partakes of the nature of sugar, and sugar is therefore a congenial addition to it, when its properties are changed by the separation of its particles in getting cold, and the cream rising.

A farmer had a filly foal from a cart mare, and the dam would not allow the foal to suckle; after, in vain, trying all the means they could devise to get her to suckle it, the gude wife took it under her care to rear it; she gave it new cow's milk with sugar, and it grew and went on very well, eventually becoming a good mare; this is nearly fifty years ago; within the last five or six years the son of that farmer had a similar case, and he endeavoured to rear the foal in the same manner in which his mother had reared the other; but it did not go on well, and in a week or two it died. Relating the circumstance to his sister sometime afterwards, and saying he could not think how it was, as he had done every thing he could recollect the same as his mother had done; his sister, who had nursed and reared a numerous family of her own children, and knew the essentials for that purpose, inquired if he had remembered the sugar? "No, egad!" said he, "I quite forgot the sugar; that is the reason it did not go on as the other foal had done."

Mares feed on vegetable substances the same as cows; and as the foal could not live on cows' milk without sugar, it must affect a puppy whose dam feeds on animal substances, in a greater degree than it affects the foal. The cow's milk is inferior in quality to that of the bitch, and if added to which you give a delicate and tender aged whelp this inferior milk, cold and raw, instead of warm and sweet, it must have a very injurious effect upon it; if their constitutional strength enables them to struggle through the effect without loss of life, it at least reduces their strength, and leaves them thin and weakly, and pre-disposes them for the reception of the distemper or other disorders, and I have no doubt that many hundreds of whelps are annually lost by a sudden transition from mothers' milk, warm and sweet as it is, to raw, cold cows' milk of a quality inferior to the other they have been accustomed to.

Cows' milk and mothers' milk do not agree together on the stomach of an infant, say one month old, unless a little sugar is added to the cows' milk; it is customary to feed young infants between times of suckling with bread soaked in hot water, a little milk and sugar; I know the parents of a healthy infant very well, who had during the first month after its birth, got a notion in their heads that sugar was a bad thing for infants, and therefore gave it cows' milk warmed over the fire, without sugar; but the milk always turned sour on its stomach, and the child almost immediately threw it up again, and became griped and unwell, so that they were obliged to alter their system, and allow it sugar, after which, it was healthy and well.

It appears that nature, by providing the mother with milk to support her new-born offspring, intended that the stomach should constantly have a good portion of food upon it, and have renewed supplies at short intervals, and consequently that the stomach being empty, or nearly so, is hurtful, and the younger they are the more hurtful it is for the stomach to be unsupplied. The ingredient made use of to coagulate milk in order to make cheese, called rennet, is the stomach of a calf, prepared with salt to keep it from tainting, and remaining a few days in its own curd to preserve its acidity. "Milk," says Dr. Ferguson, "acts in two ways; first, by distending the stomach if taken in quantity; secondly, by the separation of the curd, the animal is in the situation of having taken a meal;" according to Mr. Cade, surgeon, of Breaston, near Derby, and others, "the gastric juice, which digests or dissolves other substances on the stomach, coagulates the curd from milk, with the assistance of the acidity common to the stomach; the curd, thus coagulated, remains a dormant load upon the stomach, in a state something like cheese, until a fresh supply of gastric juice is poured out from the mucous membrane, and reduces it to its former consistency, and from that into chyme, before it passes off into the duodenum, where it meets with the bile from the liver and the pancreatic juice, and then forms chyle; the nutriment is not absorbed till it passes from the duodenum into the small intestines, when it is sucked up by the absorbents and passes into the system, except some trifling absorption may be from the stomach and duodenum, and also after the aliment has passed the small intestines."

It will be more fully seen hereafter, on the subject of training, that the stomach has a separation peculiar to itself of the different sorts of aliment upon it, and that the water contained in broth from flesh being boiled in it, is very soon separated, by the action of the gastric juice, from the nutriment contained in the broth, the water passing off almost immediately, and the nutriment remaining in layers of mucous upon the stomach to be digested in the ordinary course; it is the same with milk, when curded by the acidity of the stomach, which is almost immediately effected; the whey passes off, and relieves the stomach of a part of its load, but the curd is coagulated and remains a dormant load until a fresh supply of gastric juice, which is produced by being invited out from additional food entering the stomach, when the cheese or coagulated curd is digested, and fresh curd coagulated in its turn. Thus milk leaving nearly one-third of its bulk on the stomach until fresh food is taken into it, is the most congenial food for that tender age which requires fresh food at very short intervals; but as they become older, those intervals may be longer without injury, when a less proportion of milk, and a greater of other substances, is more congenial to their age. A man or dog at mature age does not eat so often as when younger; and it is found that milk, in a great quantity, disagrees with his stomach, a dormant load continuing upon it for a greater length of time, disorders the stomach, which disorders every thing else.

We, therefore, may readily perceive how it is that milk, in quantity, disagrees with grown up people; the strong healthy man is affected by it, but not in so great a degree as the more delicate is; we may also hereby perceive how it is that full aged greyhounds, that feed only once or twice in a day, run badly upon milk; their wind is well known to be thick when they have fed upon it in great quantity. We also see by this the necessity of the growing puppy from three to six months' old, and from that to twelve months' old, requiring a greater degree, from time to time, of other substances, and less of milk, and also of his being fed more frequently than a full aged dog. By the same rule we also see the indispensable necessity of the delicate whelp receiving sustenance almost perpetually, day and night, at his most tender age; and that as he grows older and stronger, eating a greater quantity, and if there are many whelps, they drain the dam of her supply in a shorter time, and then require other milk to be substituted to support themselves while the dam replenishes her own supply; if they are at that tender age altogether deprived of their dam, they of course require feeding very frequently, not only in the day, but should have some at intervals during the night; as the milk in the night will necessarily be cold when set for them to feed as they feel to want it, it is so much more necessary that the milk should have a portion of sugar in it, and a little thickened with fine flour, which will in some measure neutralize the bad effects that would be experienced from raw cold milk alone. From the effect the gastric juice has in coagulating the curd from milk, and leaving a dormant load on the stomach, if the whelps were left with long intervals between times of feeding it would endanger their stomachs being disordered in a greater degree at their tender age than when grown older and stronger.

It is generally known that some of the whelps in a litter are, when born, stronger than the others, and, especially where a bitch has as many as she can suckle, the strongest puppies come in for the greatest share of the dam's milk; the weaker ones are thereby insufficiently nourished, and sometimes never recover from the effects of it, but frequently die, although some few instances are known, where the smallest whelp will eventually make the best greyhound. Under such circumstances much care and attention to them is necessary; they should be attended to almost constantly for the first week. I was much pleased with the observation and judicious method adopted by a young gentleman, Mr. Drewry, jun. of Derby, who had a favourite bitch that brought ten whelps, the last favourite greyhound of his father-in-law, the late Mr. Rowland, of coursing celebrity; and Mr. Drewry being desirous of not destroying any of them, as they were not only out of this favourite bitch, but also by Mr. Bates's Burgundy, before mentioned. He attends to the whelps himself, and has great pleasure in doing so; when the dam has left them for a while, and returns to suckle them, he keeps the strongest whelps back, till the weaker ones have filled, or partly filled themselves, which brings them forward very fast, and they then become upon more equal terms with their stronger brotherhood; those stronger ones will always take care to have their share of the milk when afterwards they get to the dam, by which they suffer no injury from being kept back a little at the first part of the time the dam comes to suckle them. Mr. Hassall informs me that he has frequently adopted the same method, and found much advantage from it. Mr. Drewry, however, made another observation well worthy of attention, which I cannot find has been noticed by Mr. Hassall or any others of whom I have inquired; in these ten puppies there are only two party-coloured ones, blue and white, and they are the smallest and weakest of the litter; three black ones, three red ones, and two blue ones. The black ones are decidedly the strongest of the litter. I was not aware of this at the time I was treating on the colour of greyhounds; and, as in page 85, it is there stated from the Stud-Book, that out of 1352 winners of cups and other prizes, 617 of them were black, or black and white, the party-coloured ones only being winners in 281 instances out of 1352, or nearly in the proportion of five of the uniform colour to one of the party-coloured ones. I am not aware whether it is, or is not, generally the case that the black ones are the strongest when first born; but the strong coincidence of this case, with the result of the black colour winning, in so great a proportion more prizes than any other colour, leads me to think that they probably are generally born the strongest, and is a subject highly worthy of the breeder's attention in his selection of those which he means to preserve.

It is a useful consideration also in another point of view; it tends to prove that although good rearing is very essential, yet that the best greyhounds are the best when born; and as to be a good one born, it must be a good one begot; consequently carrying the principle farther on to the selection of sire and dam, and all the requisites before enumerated of colour, breed, suitableness of shape to each other, constitution, and the other et cæteras. Taking it, for instance, as a fact, that the black whelps are generally the strongest of a litter when born, they will, of course, without this, (what I cannot refrain from deeming judicious,) method of Mr. Drewry's and Mr. Hassall's, but a method overlooked by many breeders, the black whelps will have the greatest share of sustenance from the mother's milk, and therefore we shall cease to feel surprise at black being the most prevailing winning colour. At the same time that it tends to prove black to be the best colour, and indicative of the best breed, it also tends to prove the necessity for good rearing, especially at their most tender age; the probability being that the black greyhounds would not have been winners in so great a disproportion over other colours, had they not, from their greater strength when born, had the greatest share of sustenance from the mother the first few weeks after their birth.

Ten whelps are a heavy number to hang upon one bitch, even only till one month old; and I was again very much pleased with the plan this new beginner of rearing greyhound whelps, Mr. Drewry, adopted, before this litter were old enough to lap milk; I found him, with a glass bottle, such as is used for infants, and a little linen wrapped round the neck of it, to form a sort of nipple for the whelps to suck, and feeding them with new milk about the heat they have it from the mother, of which the whole ten took more than a pint at one feeding. Few breeders of greyhounds would be at this trouble; but there must evidently be a benefit from it, and to an anxious amateur, a very great pleasure also; by this attention to them a greater number may be kept with the dam, without having recourse to nurse bitches, which in fact are perhaps quite as much trouble in the first instance, and for a few days, to get the nurse bitch to take kindly to the whelps, and the whelps to suck freely of their nurse, as to watch and nurse them in the manner here stated. He repeats this feeding as often as necessary, which necessity is easily perceived by the restlessness of the whelps, and the dam not showing a disposition to suckle them, arising from her reservoirs not being sufficiently replenished with their new supply of milk. I cannot refrain from advertising Mr. Drewry as the best *wet nurse* of greyhound whelps in the united kingdom.

This system of assisting the dam has also another beneficial effect, even if there are only few whelps in the litter, as it is a gradual transition from the mother's milk to other milk, and prepares them gradually for finally leaving the dam, and subsisting entirely on other milk; whereas a sudden transition from one wholly to the other wholly, is generally attended with a falling off in the appearance of the whelps; sometimes with illness, and sometimes is even fatal to them; or if not so at that time, it weakens and pre-disposes them for the reception of distemper or other disorders. If they are gradually prepared in this way for entirely leaving off suckling from their dam, I should nevertheless recommend a portion of sugar in their milk for a week or two after, leaving that off gradually also; but if they are not previously prepared, by having had none other than mothers' milk till they entirely leave it off, a little sugar will be more necessary, or I may say it is indispensable to their doing well.

We know that milk differs in its quality, even from animals of the same species, where there is a difference in size and largeness of bone in the different sorts of each species; the milk from a long-horned cow, for instance, yields more cream and butter, than the milk from a short-horned cow, yet the latter often gives a greater quantity of milk than the former; the long-horned cow is generally larger boned than the short-horned one; and why may not the same difference exist in a larger or smaller boned animal of the canine species? A new milch cow is frequently purchased to assist in fostering and forcing a thorough bred foal, under the general admission that he requires forcing to bring him to perfection; and the long-horned cow is by many chosen in preference to the short-horned one, from the circumstance of her milk being considered of the richest quality of the two.[1]

The high-bred delicate greyhound whelp requires this forcing equally with the blood foal, and the more tender his age, the more essential is this artificial aid to his future growth. I had an instance a few days ago of seeing the difference between a dog that had been well forced when a whelp and after leaving his dam, in one that was three parts of the bull dog breed, and one part mastiff; he was nearly as large, and I should think would weigh nearly as heavy as most of those which are all mastiff, although only one-fourth of the breed, and three-fourths bull-dog breed, the latter being generally not much more than half the weight of the former. He had been fed principally, when a puppy, on new milk, in plenty, and crushings from cheese; his own brother of the same litter, which had not been forced in this way, is not so large nor so heavy by at least one-fourth.

With respect, however, to nurse bitches, it is probable that the milk from a mastiff or other large boned bitch, may assist the growth of the bodily frame of the greyhound whelp; but I am not confident that Sir Thomas Elyott is wrong, as to the "chylde sucking the vyse of hys nouryse from the milk of her pappe;" and as it is of the greatest importance that the natural propensity of a greyhound should not be depraved in his bringing up, so would I prefer substituting, in case of need, the milk of a different species of animal, that of a cow, for instance, instead of that from a mongrel bitch. As the milk is in fact so intimately connected with the blood, and the nutriment in its absorption from the intestines is conveyed by the blood to the heart, and from thence to the milk reservoirs, the milk from a mongrel bitch for a length of time may impart a portion of the propensities inherent in the mongrel breed, to a suckling whelp of a different breed.

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[1] It is customary, when a new milch cow is sold, to consider the calf to be included in the bargain, without any particular stipulation being made to that effect. A sporting gentleman who had a blood foal, bought a new milch cow of a farmer, who, according to custom, took the calf to deliver it with the cow. When the gentleman came to pay the farmer for his cow, he saw the calf also. "What do you bring that *cub* for?" said he; "Why," said the man, "I thought you expected it also;" "No, no," said he, "I want none of it; take that d——d cub away with you." "Very well," said the farmer, "I will do so willingly," and received the whole sum agreed for, and the benefit of selling the calf for an additional sum into the bargain.

If a bitch has more whelps than she can suckle, and one or more is of necessity obliged to be taken away from her, even on the day they are whelped, they may be reared without a nurse bitch, and with every probability of becoming as good greyhounds as those suckled their natural time by the dam. For this purpose they should have milk in plenty warm from the cow night and morning; the intermediate times of feeding, their food should consist of warm flesh tea (horse-flesh would do) made in the manner of beef tea; not over strong the first few days, but made stronger as they get older;[1] a little sugar and milk, and thickened with fine wheaten flour, bread crumbs, or raspings of bread, omitting no opportunity, when old enough to eat bone, to give them very small bones from veal or lamb, or from those animals not of mature age whose bones are softer and easier to crush than bones from full aged animals. If at any time while growing a puppy is of necessity, for want of milk or other congenial food, obliged to be fed principally upon animal substances, as flesh or butchers' offal, such should previously be boiled to get rid of the raw, foul, watery and heavy particles.

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[1] To make tea from beef or other flesh, every particle of fat, gristle, or cartilaginous substance, should be cut away; the flesh cut in small bits, put into boiling water, and kept at nearly a boiling heat for two hours, when the decoction is exceedingly strengthening. Two pounds of beef will scarcely make a quart of tea of such strength as is given to grown up people; but for very young whelps a much greater quantity may be made from the same weight of flesh, and one making will serve for some days, so that it is ready for a sufficient quantity to be warmed each time the whelp is required to be fed.

I knew a bitch that proved an exceedingly good runner, that was rescued from the watery element in which she had been destined to be flung when a few days' old, and reared in the house without either mother's milk or by a nurse bitch; and another of a litter of ten, where the dam was short of milk; this bitch whelp, when not above a day or two old, was very small and delicate, and, as they said, half dead, was reared in the house by hand, and proved the best of the litter, all of them living to be runners; and what is more, she was the best of a litter of good ones, was at two years old sold for a good price, and she won several sweepstakes. I know not, however, whether anything in the nature of beef tea was had recourse to in rearing these two bitches.

Duke Edmund de Langley says, "They should be fedde with gootis mylk or cowes mylk and cromes of bread, ymade smale and put there inne." In nursing very young infants, it is a good way to put some very fine flour in a linen bag, press it down as closely and hard as possible, and tie it up very strait, and boil it for half an hour; when cool, untie it, and it will have the appearance of a piece of sugar loaf, but not quite so hard; you may easily grater it into the milk, and it nourishes the infants very much. This would be very useful for delicate and very young greyhound whelps when deprived of mothers' milk, or of a good high-bred foster nurse, and is better than merely thickening their warm milk with raw fine flour, as the boiling it so long will deprive it of its raw and foul particles.

It is, nevertheless, best for them to have mothers' milk when they can have it in plenty, taking care to prepare them by occasional additions of cows' milk, against the bad effects of a sudden transition from one to the other; and if so many of them that they cannot have a sufficiency of mothers' milk, by these precautions there is no need "to cast the dwindling refuse to the merciless flood, fearful of overloading the indulgent mother." If they have mothers' milk in plenty, and she is fed partly with flesh and bone as she ought to be, the whelps have not only their most natural aliment, but they have milk of such quality as renders beef tea, and the other things of much trouble, unnecessary; they receive the essence of those substances in the mother's milk.

Selection of Puppies.

The heaviest whelps, according to Demetrius, should be placed under their own dam. Many coursers make a point of weighing them as soon as they are dropped, as the surest criterion of strength and firmness is to weigh them before they have received any partial sustenance after birth; they are then in their pristine state. I would, if obliged to choose so early, make choice of the heaviest dog whelps, or the heaviest bitch whelps, but not choose a dog in preference to a bitch, because the dog whelp is the heaviest of the two; the chance, however, of selecting the best whelps at that age, or even much older, is so very uncertain, and so often proves wrong, that other coursers say you have as good a chance to have the best whelps by choosing them blindfolded; there is often eventually found so very much difference in the goodness between two of the same litter, that if you "cast a part of them to the merciless flood," you may not improbably drown the only whelps which are worth the trouble and expense of rearing.

Some coursers select their whelps by the length of their *sterns*, as the best indication of good breed, and also an indication of the length of frame, such as gives the longest stride, the tail being in proportion of length to that of their bodies. I know an instance of an old and experienced courser having to choose one puppy out of a litter of eight, and he chose it by that test only; measuring with exactness the length of each of their tails, and selecting that which had the longest, and this proved to be the best greyhound of the litter.

The late Mr. Mundy's mode of choosing puppies will be paid attention to by all amateurs of the Leash, and the result of his long and scientific experience will be shown by an anecdote of him when on his death bed. That good and worthy man, and much respected friend of his, Mr. George Chaplin, of Tathwell, near Louth, called to see him during his last illness, and sat an hour or two by his bed-side. His love of coursing had not left him, but he observed to Mr. Chaplin that his own coursing days were over, and he had but one dog and two bitches left, and both the bitches are now suckling their puppies; you shall have them and their puppies. "No," said Mr. Chaplin, "that will be too much, as you have other friends who would be glad to have some of them; but," said he, "I will accept a brace of puppies from each bitch." Both litters, with their dams, were immediately ordered to be brought up into his bed room. "Now," said he, "I will show you how to choose a brace of whelps;" he then took each litter, and hung them by the claws of their fore feet to the bedstead to hang down, and chose those whose hind feet reached the lowest down, making the parts which give the greatest length of stride his criterion.

Another way of ascertaining their length of stride, instead of hanging them by the claws of the fore feet, and letting their hind feet hang down, is to allow their hind feet to touch the ground, and measuring their length by holding their fore feet up the wall as far as they will reach. Mr. Hoskins informs me, that Mr. Mundy more generally measured them in that way than in the other, and probably the best way of the two, as by hanging down they will often not let themselves out their full length; but while they feel their hind feet touch the ground, they will not contract their muscles, but allow them to extend while you reach their fore feet upwards.

In assisting a friend to select two whelps out of a litter of seven, not quite one month old, we adopted Mr. Mundy's plan, in conjunction with paying regard to the fineness of head, neck, and length of stern, and the fore legs being apparently good; we held their fore feet to the top of the wall, at the bottom of a window frame, and let their hind feet hang down the side of the wall; the longest dog reached within half an inch of twenty-four inches; the longest bitch within half an inch of the length of the dog; the others varied from half an inch to three inches in length; one was full the thickness of a brick shorter than the longest.

Now as this method indicates the length of stride much more correctly than the height and length of body in either whelp or full grown dog, there must be a corresponding greater length of stride when grown to full size, as when only so young as a month old; if therefore the back and other parts are correspondingly well furnished to support the necessary repetition of their strides in a course, there is every reason to expect that the longest whelps, measured in this way, when grown to their full stature, will have the greatest speed, supposing them all to be fed and managed alike during their growth; nor can I think of a better criterion, or a better example to follow, than that of so good a judge of every thing appertaining to greyhounds, as also in other things, as was the late Mr. Mundy.

Mr. Chaplin's two brace of whelps proved very good ones, but I have no information of their comparative goodness with the others of the litters from which they were selected. The two whelps chosen in the same manner are not yet old enough to know their comparative merits with the others of the litter. Another litter which I measured in the same manner, are not yet old enough to know which is the best; but I measured them three times in exactly one calendar month; they increased in length of stride nearly the same, one as another, with only a trifling more increase of the longest than the shortest; but the general increase was fourteen inches four-eighths in thirty days, or about half an inch each day.

I am informed, though I know it not for fact, that Mr. Mundy and the late Lord Rivers, made a practice of first selecting a bitch out of each litter, as their principal choice to carry on the breed; this choice was not governed by length of stride as in the case mentioned, but they chose that bitch which had the most resemblance both in colour and general looks to the sire; supposing by that method they should have, in her, the more perfectly united best qualities of both sire and dam. Mr. Mundy's method of examining the bitch whelps for this purpose was, first placing the whelp on his open hand with its head towards him, then lifting up its head to examine if he could discern any likeness to its sire; after which he passed his finger along its back, and raised up its tail to judge of its length. The bitch whelp that appeared to him most to resemble its sire, he preserved with the greatest care as long as he continued to breed from her, not suffering her to be distressed by much severe coursing, always considering that, to preserve a good breed, the bitches should be taken the most care of.

It is said of the late Lord Orford, (see Coursers' Stud-Book, p. 14,) "that it was his fixed rule never to part with a single whelp till he had had a fair trial of its speed;" this is the most certain way of having, not only good runners, but also the best and most proper ones to go on with to breed from, if you allow that trial to be till they are grown to maturity, or nearly so, allowing for any great difference in size, or looseness of shape on the one hand, or compactness on the other, and will account for Lord Orford's great celebrity and success as a courser; for if you breed from the worst of litters, whether worst in shape, or slowest in speed, the breed will certainly degenerate, except there should be that suitableness of cross in shape of sire and dam, found by Mr. Hassall's Hour-glass and Harriet Wilson, before mentioned. There may be an odd one or two, that proves good, which cannot be so otherwise than by chance, as no certain general principle can be laid down for it. If you gather early garden peas for seed, you reserve those which become ripe the soonest; for if you only reserve those which become ripe the latest, they will not produce peas so early the next season as the others.

Mr. Hassall says, "I should certainly let my puppies see a hare now and then, perhaps once in a fortnight, when they arrive at twelve or thirteen months old, taking care in the first place that they had some previous training, and also that the place I selected would only produce a short course, and I would run them if possible with an old dog which was both a good fencer and killer. There are two decided advantages derived from this system; in the first place you teach them to turn, and give them a facility of keeping with the hare, though it must be admitted that nature has gifted them differently in this respect; and in the next place, if you are fortunate enough to have your puppies born soon after Christmas, you may often know which to draft without being at the expense of keeping them till another season."

Mr. Drake says, "If greyhounds are pupped in February or March, the following March they will of course be twelve months old, and curiosity will naturally induce you to give them a trial, that you may be better able to make your selection; the trial over, some of them you like, others not so much; those you like are kept for your own kennel, the others given away; now I do contend the latter ones will often turn out the best greyhounds, being less susceptible of running cunning; I have seen very many dogs run better when fifteen months old than they did ever after, because their natural propensities are to kill, and if disappointed in the first few turns of catching their prey, they give it up and never try after. It is my opinion, be a dog or bitch whatever size he may, he should not see a hare before he is two years old; certainly not before he is twenty months old; in order to have him good and lasting; that if your selection be not made in the first month, it cannot be made with any degree of judgment till they are at least two years old. At all coursing meetings you will see some puppies run well; many are naturally good, but very many are apparently good, because they are innately cunning, and will run better when puppies than afterwards."

Those you reject at the age alluded to, very often turn out the best greyhounds, which may be accounted for in various ways; but I think their being "less susceptible of running cunning" is the least or last of these causes, if any cause at all; most, if not all greyhounds, be they managed how they may when puppies, will show craft after running many seasons, so may they be said to be innately crafty; yet I much doubt if they really are so, as it is more an acquirement with a true bred one, than an innate propensity. Sagacity is an innate faculty in a dog of any species; so is fire and courage; the two latter are more so in greyhounds than in any other dogs, while of sagacity they have perhaps the least; they have a docility and shyness, or as some would term it, a want of impudence, which is peculiar to them; hence any disappointment when young at catching their prey or not catching it, has a very discouraging effect upon them; where there is any sagacity at all, it will be available to them when distressed, and in time they will become crafty.

But at the age alluded to, where puppies are all managed alike, if there be any particular craftiness displayed by one or other of them, it is probably from a want of pure breed, or it is derived from that faculty having been exercised to a great degree in one or both parents, as such will affect the offspring; otherwise good bred ones will not show craft at that age unless they are coursed too much, and distressed with long and severe courses, but will run their best; while a cross bred one will show it by his running and manner of pressing the hare; not by showing the most speed, but running in that way which would induce you "to like him the best." Being naturally of a smaller size, or from being more compact in his frame, or possibly from other causes, he is enabled to run best when young, while the more lengthy and loosely made puppies are weaker, and run worse at that age, yet make the best dogs when grown to maturity.

Where expense or convenience is no object with the breeder, it certainly is the best way to keep all the litter till they are of mature age, when you not only find which has best speed, but also which is the best to go on with, and to breed from—a matter not to be made light of. If expense be an object, or you wish not to keep the whole for other reasons, selecting those you wish to keep in the first month, is perhaps the best way, as the other half way between is like many other half measures, not so effective as to pay for that half expense of keeping them to that age.

In making the selection within the first month, Mr. Mundy's system is what I should prefer to any of the others, not overlooking straight fore legs, fineness of head, neck, and length of stern, nor the "marks of their renowned progenitors;" this, however, makes it of greater importance not to cross different colours in sire and dam, for if you do, you have all the colours of the rainbow; while if sire and dam are both the same colour, you will have all the puppies nearly of the same colour, which simplifies the selection to length, and the goodness of their appearance in other respects, and by measuring the dogs and bitches separately, you will choose the longest of each sex.

With respect to entering and coursing puppies very young and frequently, or not coursing them at all till they are at, or near a mature age, there is a proper medium to be observed; some attention should be paid to their size, as a large, loosely made, lengthy dog is more liable to injury from great exertion than a smaller or more compact one; very late entered greyhounds seldom if ever prove first raters; it is the same with the horse, when that opposite extreme to working him severely very young is adopted, of not working him at all till six or seven years old, of which practice in the few instances I have know, the horses were all sluggish and heavy in their paces, without fire or energy, but such great eaters, that you would scarcely keep them from being much too fat and full of flesh; after eating as much corn or hay as you would give horses in the ordinary way, they would eat the litter with which they were bedded.

If a man has no particular object or purpose in view, only walking for amusement, pastime, or exercise, he walks leisurely, and perhaps slothfully; but give him an object to attain, and he moves quickly and with energy, if such he have in his composition; so it is with the greyhound at exercise, or in his playful galloping, that has never been entered to his game; he may possess some animal spirits and liveliness, and gallop and scummer about, but he knows not what for; there is a vacancy and a foolishness engendered in him, when that system has been continued till he is full grown and of mature age, which extends to his ultimately being entered to his game, and continued to be taken to the coursing field; in addition to which, in his exercise and play he does not exert himself so much, nor promote the growth and strengthening of his limbs as if more energy were instilled into him; that playfulness of disposition *decreases* as he gets older, he learns a sort of slothfulness, and is fond of being at ease; and we know from various circumstances that habit has great influence over nature.

Very early entries, as six or eight months' old, are very likely to give dogs a disposition to stray; but if, on the contrary, you enter them to their game at twelve or fifteen months' old, for instance, when they are become more settled in their dispositions and accustomed to some control, and if it is where you can rely on a *short course*, and a *kill* at the end of it, which are very important matters, and in which Arrian's system is worthy of attention, though not within the means of every courser; yet if you can succeed in a short course and the kill, it arouses or awakens their natural instinct of enmity to their game; and by repeating these *short successful courses*, at intervals of two or three weeks for instance, between times, you keep that natural instinct of enmity alive, and in increasing vigour, which imparts fire and courage, and excites and stimulates them to greater energy, and further progressively strengthens their frame, as they exert themselves in those courses, though short ones, more than in their own playful exercise; the whole animal fibre is on the utmost stretch, and all their physical powers in their full action; their future playful exercise will also be of better quality, by their increased energy causing greater exertion in their play.

As they get older by three or four months, rather longer courses would be desirable, or two moderate courses in a day; but even then, I would not have less interval between times than two or three weeks, as the greatest danger in an anxious courser is his not bridling or curbing his own inclination to see his fine and beautiful puppies run too often. You may form some idea of difference in the strength of limbs in a puppy and an aged dog, by observing the comparative ease with which they will crush and eat the bones of veal, to what they will those of beef; I gave a dog the large bones of a shoulder of veal within a few days of writing this, the knuckle part of which might be supposed too large to get between his crushers, but he ate it all clean up in about a quarter of an hour, while the same part in a cow you would have some difficulty in breaking with a hammer. If therefore they are, when young, put to their greatest exertion for too long a time, it must fatigue and tire them; and though no absolute injury may be done to their limbs, yet that fatigue will soon teach them craft and cunning, and the memory of a dog is very retentive. The bones of a puppy twelve or fifteen months' old may be deemed, in firmness and solidity, about half way between the bones of a calf and those of a mature aged cow.

With respect to any particular age at which a puppy should be entered to his game, a few months is of less consequence, *much less*, than other considerations; where you can calculate with tolerable certainty upon a short course and a kill on the one hand, or the uncertainty of a kill and a long course on the other, it is of more consequence than a few months in the age of the puppy; in the former, it matters but little whether you show him one hare in a day, or two or even three hares; and again, it depends on the size and shape of the puppy; a small sized dog, and compact in his frame, will sustain less injury than a lengthy, large, loosely made dog. For this purpose, early in the season, September, or even August, before leverets are got to their full strength, which are fair competitors with puppies that are in a corresponding state of weakness, so far as regards running the puppy; but to secure a kill, the puppy ought to have *two* good aged dogs with him instead of only one, and this for two reasons; the greater probability of a kill, and the encouragement instead of the disheartening of the puppy; for with only one aged dog, that may dishearten the puppy by over-running or passing him, with two aged dogs, their contention against each other will emulate the puppy to the same contention. These are matters of more importance, as the principle to act upon, than a few months in the age of the puppies; always bearing in mind, that it ought not to be put in practice too often, for the reasons before stated. If you cannot rely with tolerable confidence on short and successful courses, I would defer it a few weeks, or even months longer, before running them, sooner than distress and discourage them when very young, as such would be a greater evil than deferring to awaken their natural instinct of enmity to their destined game. They ought also to have at least a few days' previous preparation of feeding, and to be encouraged to gallop about before entering them, or afterwards coursing them; dry feeding, without slops, as liquid broth or other things, that their wind may be in better order is requisite. Oatmeal balls, as hereafter recommended as a preparatory food previous to being put into strong training, would be very proper for them when old enough to be entered, and also as good food as any other to go on with from that time, with occasional variations. If a quarter or half-a-pound more of flesh were mixed in every puppy's ball each day for a few days previous to coursing or entering the puppies than the quantity there set down, it would not be amiss, as it stimulates and excites them, producing more courage, and renders them less likely to be disheartened if disappointed of killing their game. Of so much importance do I deem it for the future goodness of a puppy not to be disheartened on first trying to enter him to his game, that however averse I am to anything unfair towards the poor hare, I would on these occasions strain every nerve to kill her for the puppy to *mouth*, and know what he has to run at in future. I know not any other occasion on which unfairness to the poor hare can be justified by a true sportsman.

It is a bad practice to run a puppy a course and not take it up in couples immediately afterwards, and cherish and caress it; when accustomed to run at liberty, and possibly to run another course or two, as is very likely to be the case if you quarter him out with a butcher, who takes the puppy with him when he goes about buying fat ware off a farmer in his fields; then if you take the puppy out to course, and run it, you have often very much difficulty in taking it up again, which hinders the sport, and what is worse, the danger of its seeing another hare before being secured. Greyhounds requiring kindness, are easily made shy with harsh treatment, yet require to be under some command, but if properly managed in kennel discipline, one word from their owner or feeder is generally sufficient. If a puppy is shy at being taken up after a course, and you have a dead hare in your hand, throw it down to the puppy, and while it is mouthing the hare, you may secure it; at which time you should caress and encourage it so as to become familiar, which will make it easier to be taken up in future.

Mr. Drake says, "They should, when ten months old, be let out every day to exercise, walking on the road, and occasionally into a ploughed field where the soil is loose; there they will run about and delight themselves much; at this time they should be named, as no dog is under proper subjection till he knows when he is spoken to by name; then you can chide any one of them at a distance by speaking loudly, and cracking your whip, which should always be in your hand while at exercise." I have seen a litter of puppies not more than seven or eight months old, that, by kind treatment, and using them to be coupled together, if you opened the couples and showed them to the puppies, they would come straight to you, poking out their noses for the couples to be put round their necks.

They should be taught early to run together in couples, for if you let them be old before they are used to them, they are very awkward in taking to them; I have known them to be quite spoiled, and made shy all their lives, by the servant losing his patience at their stubbornness, and abusing and beating them; if one, not more than four or five months old, for instance, were coupled with another seven or eight months old that is already broken into it, and leave them awhile to settle their contention themselves, they will soon become accustomed to it, and be quite tractable.

Much and irremediable injury is very commonly done by the practice of coursing puppies before they are arrived at a proper age to have their limbs thoroughly formed and strong, and their joints knit and well set; and this injury is to a much greater extent, and the practice carried to a more extravagant length, than the impatience of sportsmen to see their puppies run, will allow them to admit; nevertheless the fact is so. The fashion, or I may say, mania for puppy cups and sweepstakes, is like the mania for running two or three year old stakes with horses, and breeding from young parents that they may be the forwarder in their growth for that purpose, whereby we have very few really good aged horses on the turf. With greyhounds, the disadvantage is two or threefold, as it is not only productive of injury to the bodily frame, but of teaching them craftiness, which their retentive memory never forgets. For a puppy to win a cup or stakes where sixteen dogs are entered, they have to run four courses; and in an entry of eight dogs they have to run three courses to win it; whereas horses for these young stakes have generally to run only one heat. If a number of gentlemen club together to have trials of puppies, they should run them in mains, when the injury would not be so great, as they have then only one course each to run.

If, by refraining from coursing the puppies so early, six, or nine months' more expense without sport from them, is not so much expense thrown away; it is only an exercise of patience, to be repaid with a two or threefold benefit; for greyhounds will run as well for two or three years longer or better, and far more honest, than when run very frequently while young.

In rearing horses the same principle should be acted upon; for whether you choose to *force* them with corn when foals, and as they grow older or not, they should be brought gradually to it;

a smaller quantity of corn and dry food when young, and increased as they get older, with plenty of their own natural exercise. Without the latter, they stand a very poor chance of eventually making *good powerful* horses, though they may be large in stature and substance. It is not desirable for them to be altogether without work, at three years old, even if they are at liberty in the field to take their own exercise, as their exertion, whether of the draught, or the nag, or the racing kind, should be brought gradually to them; and moderate work is more beneficial in strengthening their parts than their own exercise in the grass field; but it is too much the practice, especially with draught horses, when they have once become steady to the collar, to work them the whole day the same number of hours which they work the full aged horses that are so much more able to stand that work. This should be avoided whenever it can, and their quantity of work regulated by their age, and their ability to bear it. In the winter season, when they have got their four, three, or sometimes even two years' old horses to work, they not only work them the full number of hours in the day with aged horses, but, with them, they are kept in the stable all night; whereas, if they were spared part of the day's labour, and, after being well fed, were turned out all night to take their own exercise, it would be much more congenial to their age, than standing twelve or fifteen hours confined in a stall, their young, weak, and tired legs swelling, and promoting humours in them for want of gentle exercise, and relieving their fatigue gradually, which they would do if at liberty; if this were done till they were of full age, or nearly so, we should not see so many swelled and disordered legs amongst draught horses which we now constantly do; they would come gradually to their strength till it was established, and would continue to have clean good legs after they were of full age, and be better and more fully developed in all parts of their body.

I am aware, that with very many, there is a want of convenience, and almost impossibility of doing this; but where it can be done, and where they aim at the greatest perfection in their cattle, it ought to be done, with any description of horses. Hackneys, hunters, and race horses, would all profit by it in the long run. It is not the grass they would eat which would be any particular benefit, although as a change from what they had eaten in the day, it would not be without its benefit; it is the exercise and open air which would be far more beneficial to their growth and strength than many people imagine as being so congenial to their age. If there be a shed or open stable for them to go in or out at pleasure, they will much more generally be found out of, than in it, even in very cold weather; a storm will drive them in, or they will go in to eat any corn or hay there is for them; but they will generally be found, even when lying down, to be out of doors. When their growth and strength are fully established they do not require this, what I would term, growing exercise, although even then, if left to their choice, they would prefer it. Aged horses that are hard worked, as hackneys, or even hunters, will often perform the most work under this treatment; but that is not particularly owing to exercise in the night, but to the change of food, perhaps by the very small quantity of grass they eat, and the cool open air, causing them to eat more corn than they would if kept entirely in the stable. Of course they should be perfectly cool, and dry from sweat, and well fed, before being turned out.

Young horses for the road, or for hunting, would be better horses at full age if treated in this manner; a tolerable quantity of gentle exercise, alternated with occasional change of paces, and ridden over rough ground to make them *find their legs;* if this were done both in the forenoon and afternoon, not too long at a time, and turned out at night, even in winter, with a shed or open stable to go into at pleasure, some hay and a little corn, they would make much better horses than with being in the stable all night; and the same may be said of race horses. They give two year olds plenty of walking exercise in the day, which is all very well, and the same by three year olds, and so on; but they are kept in the stable generally all night; and if they must run for two, three, or four year old stakes, they must of course be trained, and being in the stable cannot be dispensed with; but if their racing at those ages could be dispensed with, and the out door at night system adopted, they would make much better runners, and stronger, finer horses when at full age.

In the many large establishments for breeding horses for the turf, how many two or three years old are trained and found to run but indifferently, in comparison with others in the same stable, and are in consequence deemed cast-offs, turned out to grass again, and to take their chance a year or two, or till some purchaser comes and buys them for an *old song*, in comparison to what others are sold for, yet eventually make much better cattle than those that were considered more *choice articles*, and kept in training and in the stable all winter? Witness Mr. Houldsworth's stud, Arachne, Giovanni, and that bit of pure good horseflesh, little Vanish, that were considered cast-offs, and turned out, besides others; their subsequent running proving how beneficial that open air and natural exercise were to them after having been put to some work to have their trials, which promoted their subsequent growth, and their strength made more perfect by having their limbs at liberty in the field, while the others were confined to a stall in the stable.

If instead of giving only oats for corn as many do to their young horses, they would give them a provender of sometimes split beans, other times oats with a good portion of bran and plenty of hay, it would strengthen them more than that sameness of food, only oats and hay; but nothing is more essential than that the hay should be of perfect good quality; for if of bad, or even only inferior quality, it is very likely to produce constipation, and predispose for broken wind.

Feeding and Management of Puppies after leaving their Dam.

The feeding and management of puppies after leaving their dam, would appear more in order before that of entering them to their game; but the question of selection when suckling whelps is so mixed up with that of waiting till they were entered to their game, and had a trial of their speed, that I thought it better not to separate them, for the purpose of going more progressively on with their growth.

Arrian says, p. 148, " When puppies can run about, Xenophon properly recommends that they be fed of milk; for the filling them with heavy food distorts their legs, and occasions diseases in their bodies. Xenophon recommends milk for the first year; and, according to Duke Edmund, ' they have great nedde of their dam in to the tyme that they be ij monthes olde, and then they should be fedde with gootis mylke, or kowes mylke, and cromes of brede 'ymade small and put there inne; and especially in the morrowe and at nyghte by cause that y^e nyghte is more cold than the day, and also men should give hem crommes in flesh brothe, and in this wise men may norfshe hem tyl thee be of half yeere old.' Turberville says, 'The longer they taste of their dammes teat, the more they shall take of her complexion and nature. And when weaned, it is best to bring them abroad with milk, bread, and all sorts of pottages, and you shall understand that to bring them up in villages of the country, is much better than to bring them up in a butcherie.'" The translator adds, "how close is the analogy touching the acceleration of growth and stature in the human and canine subject!" In breeding for the kennel, Lord Bacon's observations may be turned to some account. "Excess of nourishment," says he, "is hurtful; for it maketh the child corpulent, and growing in breadth rather than in height. The nature of it may be too dry, and therefore children in dairy countries do wax more tall than where they are fed more upon bread and flesh. Over dry nourishment in childhood putteth back stature." Upon which principle Albertus Magnus orders liquid food for the dog, because his temperament is dry.

Mr. Hassall's remarks upon this subject are analagous to the above quotation; on the subject of training, he says, "The feeding ought to be twice each day; for by giving a dog a hearty meal, which you are obliged to do to sustain nature, if you only feed once a day you distend the stomach to an unnatural size, and thereby make the dog feel very uncomfortable, as well as overstrain the digestive organs; this observation applies in a particular degree to the rearing of puppies; they ought to be fed at least three times a day; overgorging them has a tendency to make them grow out of form, and by overloading them either with food, or making them beastly fat, the pressure upon their legs and feet is greater than they can bear in their gristly weak state, and it is apt to make them weak about their ankles, and their toes too long."

A hearty meal not only weakens the digestive organs and agency, but it produces more thirst than a moderate meal; and by lapping water or other liquids to quench their thirst, they increase the evil of distending the stomach, and also weaken the agency of digestion; besides which, giving a full meal induces a habit ultimately of insatiable gorging, the stomach and intestines acquiring progressively a greater capacity; while, should a dog be a small feeder, more frequent meals will have the effect of strengthening his stomach and increasing his appetite. To imagine that acquiring progressively a more capacious stomach will ultimately be any benefit by enabling him when at maturity to eat a greater quantity, and thereby become stronger and capable of enduring more severity of exertion, is what old Gervase would term, "an erroneous fancy;" for when at maturity, to eat all his stomach will possibly contain, rather produces weakness than strength in the animal system. A great quantity of food, and eating often in the day, are only requisite for growth or fattening; a moderate quantity, or what may be termed a tolerably full meal, of solid and nutritious food, with little or no liquids, produces the greatest strength and wind; and if growth or fattening be required, and the stomach will not contain much quantity at one time, it must be given oftener in the day.

This applies more to growing puppies than to aged dogs; aged dogs, when wanted to course, require a certain medium to be observed, and a disadvantage will be found from stinting them too much in quantity, which will be more particularly alluded to under the head, Training.

It is desirable when their constitutions and strength are tolerably well established, which may be considered in a bitch at nine, and a dog at twelve months, that they should be accustomed to some privations, to give them more hardiness of nature; they should occasionally fast for a day, or be scantily fed for a few days together, or be fed with poorer food, as is elsewhere seen, to assist nature in ridding itself of impurities; it relieves the whole system very much, when they have previously been fed luxuriously for a length of time.

I am averse to all kinds of jelly food for a healthy dog, yet some coursers succeed in rearing good greyhounds by giving them plentifully of sheeps' trotters, with the wool on them, cows' tails, and such like, the bones broken after being well washed from dirt and filth, and stewed down; this I take to be the best kind of jelly food, either for a growing puppy or an aged dog, but the chief benefit of it is derived from the bones, eating them with the jelly, as some portion of the oily and nutritious matter contained in bone is included in the jelly by culinary process; nevertheless it is too rich for a puppy given alone and in great plenty for many weeks, or even many days; it would have a better effect if given with plenty of bread and vegetables.

Milk is the most congenial food for a young puppy, and when first taken from the dam, he should be fed oftener than three or four times a day, from very early in the morning till late at night; warm from the cow morning and night, and the other times boiled, and thickened with good fine wheaten flour, or sound fine old oatmeal; as he grows older and stronger, it should be gradually made thicker, till it is as stiff as a pudding, when he gets to be six or eight months old; good crushings from a cheese tub are a very congenial change occasionally, and change of diet begets appetite, besides other advantages; puppies should also a day or two in a week be well drenched with good sweet whey, especially after having had flesh meat, which may, without injury, be done now and then in moderate quantities. The transition from being fed much on milk to that of more solid food, as they approach a year old, should be gradual, never omitting any opportunity of giving them a few bones.

When old enough to have a trial of their speed, they should have a few weeks' preparation of food without milk; for although it is the most congenial when young and growing, it is perhaps the worst possible food for good wind when running; but having been fed chiefly of it till nearly a year old, they do not sometimes take to such food as is commonly given to running dogs, so as to eat freely of it for a week or two; consequently, it requires some time to get them in a fit state for running, after leaving off the new milk system; and it is as great a mistake in the education of a greyhound puppy to run him when in an unfit state of condition, as running him too young, both as to injuring his bodily structure, or bringing the march of intellect on his mind.

I have before mentioned the necessity for not omitting bone when it can be procured not too large and hard. Dr. Ferguson says, "The ingested food, after passing into the duodenum, is in the shape of chyle, carried to the thoracic duct, when it is poured into the veins which carry it to the heart, when it enters the entire mass of the blood, and is thrown upon the fleshy parts of the body. In young dogs, where the formation of bone is constantly going on, it is of great importance that they should have a proper proportion of animal food in their daily meals, in order that their bones should receive a full proportion of support. To prove this position, the urine of young dogs possesses no phosphate of lime, the whole being directed to the formation of bone; but the moment the growth of the body is at an end, phosphate of lime, in its proper proportions, is found in the urine, the distribution being no longer necessary."

Bone possesses more phosphate of lime than any food given to a dog, flesh next, then wheat meal, and oatmeal least of any. The growth of bone should be duly encouraged in puppies; the growth of tendon is coeval with that of bone, and enables it to bear a greater pressure; the tendon possessing no relaxing power, if its growth be not encouraged, and a great portion of muscle be afterwards formed, it will, by its relaxing power, cause injury to the tendon, and make the dog lame. The brief advice of the old huntsman, on his death bed, to his son, who succeeded in that capacity, is worthy of notice: "Tom," said he, "give them plenty of bone." Cows' throats, gristly substances, and small bones, should be plentifully provided for puppies, when old enough to eat them. There is a brief saying with many, and a good old notion it is, that bones and butter milk are the best food for a young dog; crushings from the cheese-tub, and good new milk are useful auxiliaries to their growth; the greater variety they have of such food, the better. Puppies, when very young, should have milk warm from the cow; but when they cannot have it in that state, Mr. Drake recommends it to be boiled, which will in a great measure prevent them from having those obnoxious things called thread worms; new boiled milk with a sufficient quantity of old baked wheat meal bread till five months old; then barley and oatmeal mixed with boiled skimmed milk, and one or two meals in a week of asses' flesh.

I am very much inclined to think that milk in its raw state generates worms. A recent instance tends to elucidate what Mr. Drake says: two whelps were taken from their dam when about three weeks old; fed on warm milk, a little sugar for the first week, and wheaten bread; after the first fortnight they began to get thin, yet ate well, and were lively; they continued to do so till they became quite lean and poor, though fed five or six times a day in plenty; their coats stood the wrong way on their backs, and they were ready to devour every thing offered to them. I suspected worms, and ordered their milk to be boiled, which was done the remaining times they were fed that day. Next morning I counted twenty-one worms, each eight or nine inches in length, which one of them voided at one time. Two whelps of the same litter that were left with their dam, and had besides plenty of new milk warm from the cow morning and night, were, at the same time, fat, sleek, and in every respect as well as whelps could be.

What Lord Bacon, Arrian, Turberville, and others say of over dry nourishment putting back stature, is not a mere theoretical notion, but no doubt founded on practical experience. I have seen, in one litter, three distinct and different qualities and shapes in dogs when grown to maturity, by different modes of rearing them; dogs, fed on good new milk in plenty till six or eight months old, are lengthy in the frame, strong good backs, well furnished at all points, and speedy; but reared at the butcher's or at inns, where they have little or no milk, and much of flesh, bones, &c. they are thick, short, clumsy, coarse looking, and slow; quartered at the farmer's who *will not* give them new milk, but let them subsist on whey, or any thing they can pick up, they are puisne, diminutive, weak, and spiritless, and when two years old they will be no larger, nor stronger to the eye than puppies nine or ten months old; and this where there was no visible nor material difference between them when taken from their dam.

I have seen the effect, and in fact watched the results for several years in the rearing of greyhound puppies by two gentlemen whose manner of rearing was totally different from each other; it has been the practice with them, on several occasions, to divide a litter of puppies between them when ready to be taken from their dam; he, whom I must denominate the bad rearer, had an excellent bitch, and gave his friend the privilege of selecting what dog he chose to put her to; the latter, if short of cows' milk for his puppies, went to market and bought a milch cow, and ordered her milk to be given entirely to the puppies, except what more she gave than they would eat. In the dry summer of 1826, when cows gave but little milk, one litter of his puppies had the whole of the milk from four cows. This system he continued, with nothing else except common puddings of oatmeal and water, till they were eight or nine months old, when he quartered them out with butchers till old enough to course. The other gentleman, as soon as he had taken them from the dam, quartered some with farmers in the country, and others with butchers and innkeepers in the town. The farmers, in most cases, cared little about the puppy making a good greyhound, and if it had *new* milk, it was such as the farmer's wife said, when his landlord sent a puppy for them to keep, with orders to give it new milk; "aye," said she, when the servant was gone, "it *shall have new* milk, but I think there will be a blue cast with it, for if the milk be not blue from being skimmed a time or two, there will be a blue cast on my countenance." In this way those sent to the farmers were kept chiefly upon whey, and thin miserable looking things they were; those at the butchers or innkeepers were thick and coarse in their frame.

Now there was not much difference in the system of feeding and training when old enough to course, between these two friends, except with the bad rearer, when he found one of his puppies run better than his others, was never satisfied till he had seen him run again and again, day after day, till he was quite stale and cunning; while the other gentleman reserved his best for particular occasions, and made common hacks of his second raters. But the test of these different modes of rearing was seen independent of one running them too much, and the other not so; I have repeatedly seen them run together when the puppies were first entered to hare, and have seen the new milk system most decidedly beat the other nine times out of ten. The superiority of the new milk system is also proved by the bad rearer's own admission, though he could not conceive the cause of it, and by the answer given to him by his factotum manager of his greyhounds. "How is it," said he, to his lackey, "that Mr. —— *always beats me* with greyhounds of my own breeding, against my own of the same litter?" "Why," said the other, "he chooses them with good backs."

It would raise a smile on the countenance of any experienced breeder to talk of discriminating between good or bad backs when whelps are only two months old; and if such could be done, why did not this wiseacre choose good backed ones for his master? The fact, however, was, that this would-be knowing-one could see when they were old enough to run, that the other gentleman's dogs had better backs than his master's dogs had, which was solely owing to the better system of rearing, and this simpleton had observation enough about him to notice that they had better backs, but not intellect enough to divine the cause of it. Those reared with plenty of good new milk, were long and strong on their backs, plenty of liberty, good loins, and were ribbed outwards, speedy and stout good runners. While the others were short in their backs, nipped up in their loins, flat sided, and bad runners generally.

The last litter but one, three reared on plenty of milk were all very speedy and good runners; the others, reared on the other system, were all bad ones; the last litter they had together, there were but four whelps, two of which died soon after leaving their dam. I went, by desire of the bad rearer, to look at the one he kept, which he considered to be a very fine one; and so it was, but I found it pulling away at some raw horse flesh in the yard, and the servant informed me that they fed it the same as they fed their running dogs, with flesh, cow-heel, cow-heel broth, and biscuits. I saw it run when about eighteen months old, against one of the former litter reared by the other gentleman, but it scarcely ran half so fast; it had no length of frame, and could take no length of stride. The fellow puppy, reared on the new milk system, is as smart a greyhound, and as good a runner as any courser need wish to have, and many applications were made, but in vain, to purchase it.

I could adduce a variety of other instances having a similar result; but these are so closely in point, that it is unnecessary; those would-be coursers who deem new milk too valuable and expensive to give to greyhound puppies, had better give up the pursuit altogether, as they stand but little chance, with dogs of their own breeding and rearing (which, by the way, is generally allowed to be the greatest merit in the pursuit) of mounting the top of the tree on coursing ground.

A high bred greyhound requires more forcing in his tender age, than one of a cross or mongrel breed; the former is by nature very delicate when young, and forcing him with proper food does not make him coarse and heavy, as it does the latter. I have seen the latter sort when they have been well nurtured and forced, become such ravenous and greedy feeders, of so robust a constitution, that they grow, in simile, more like coach horses than race horses.

"Some greyhounds," says Arrian, "eat voraciously, others with delicacy. The latter mode of feeding indicates a dog of better blood than the former. Good dogs are not bad feeders, but fond of gruel or bread. This kind of farinaceous food is most strengthening to them, and there is no fear of their gorging themselves too much with it. When a dog is sick, administer the broth of fat meat to him, or having roasted a bullock's liver over some hot coals, and rubbed it abroad, sprinkle it like flour into the broth. This is good also for puppies to strengthen their limbs, when they are first weaned from milk. But milk is the best support for puppies till the ninth month, and even longer; and is serviceable to the sick and delicate, both as drink and aliment. Fasting, too, is beneficial to a sick dog." "The Cynosophium substitutes the lungs for the liver of a bullock, as nutriment for puppies when deprived of milk:" page 93.

Demetrius "recommends milk to be gradually added to bread (the dog's usual diet) when it is wished to raise him in flesh, until it becomes his only nutriment morning and evening. From this he is to be again weaned, by the gradual abstraction of the milk, when we desire to reduce him. In the former case he is not to have his liberty; in the latter, he is to be daily exercised. A second kind of nutritious food consists of oatmeal gruel with fat; a third of bean flour, oil, and fat bacon. Wheaten bread or biscuit, with gruel from the farina of oats, is the best nutriment for all hounds."

Markham says, "when you have a perfect and well shapt greyhound, your next rule is to apply yourselfe to the dyetting and ordering of him, for the pleasure to which you keepe him, that bringing him to the uttermost height or strength of winde, you may know the uttermost goodnesse that is within him, which disorderly and foule keeping will conceale, and you lose a jewell for want of knowledge of the value. Dyetting then of greyhounds consisteth in four especial things, viz. food, exercise, ayring, and kennelling; the first nourishing the body, the second the limbes, the third the winde, and the last the spirits. Hounds readily support themselves with dry oat or wheat meal. Flour mixed with oil and water, and flour beat up with milk." *Arrian translated*, page 92. "The kennelling of greyhounds," says another author, "is of great use, giving them spirit and nimbleness when let loose; and the best way of managing a greyhound is, never to let him stir out of the kennel, except at the times of feeding, exercise or coursing."

Arrian's remark that "milk is serviceable to the sick," is rather problematical; my foregoing remarks recommending milk to puppies, was on the supposition that they are *healthy;* but to those which are *sick*, I conceive milk not to be so good food as some others, although many persons give it in preference, as being the most congenial at that age; such an idea cannot arise from a knowledge of how milk acts on the stomach, or how the stomach acts on milk; gruel, or broth moderately thickened with bread, would be preferable when sick than milk.

With respect to forcing puppies, foals, or the young of any animal, some imagine that you force them till they grow past their strength, as very tall men or women often prove consumptive; this is an erroneous fancy. Those of weak or delicate constitutions often grow very tall; or those who do not take proper exercise, but live indolently; or even those from sickness who rest, and lie down on or in the bed in the day time, frequently shoot out, and grow very tall in the mean time; while those young people who have a sufficiency of good healthy or strong exercise, if they are naturally of a tall frame, or made more so by eating plentifully of new milk when young, which conduces to stature, they take their strength up along with their stature. Forcing them with good food, and at the same time having plenty of good exercise, is the forcing of the parts both externally and internally, which strengthens and supports the stature more than forcing the stature itself; so is the promoting their future growth by extra exertion, promoting the growth of those parts which support the stature, more than promoting the actual growing in stature. Forcing them with such food as is congenial to their age, aided by proper exercise, *cannot* conduce towards weakness; on the contrary, the time when forcing is of the greatest utility is precisely that time when they are growing in stature; for when arrived at their full growth, more ordinary feeding will do for them, so that they have tolerably plenty, and are not suffered to become very poor and lean; the latter is not profitable in any manner or shape.

Buffon's beautiful theory of the growth and re-production is in perfect accordance with what we see in the growth of animals, and, indeed, explains more satisfactorily than any other author I have read, the real cause of growing animals requiring to be fed more frequently than those which are fully arrived at maturity; and what we also experience ourselves, compared with what we experienced, with respect to hunger, when we were young.

When arrived at mature age, the body requires no more nutritive particles to be diffused through it than supplies the perpetual waste and renewal of what is always going off, as long as life continues; the surplus from what we eat, more than the body requires to replenish its regular waste, after undergoing its animalization and becoming a part of ourselves, is thrown back into the seminal reservoirs for re-production; the surplus organic particles thus thrown into the seminal reservoirs are consequently in much greater abundance at mature age than during growth, because during growth they are required to increase the stature and bulk of the body; in addition to which, that growth being regularly and constantly going on, a more frequent supply of nutritive particles is required, which causes a more frequent return of hunger, and not only a desire, but a necessity, for eating more frequently. Thus, we require to eat more frequently while growing in stature and bulk also, than when arrived at full stature but not at maturity, enlarging in bulk, but not increasing in stature; that is, the filling up, furnishing, and developing the whole structure to perfection; and in the latter stage, we require to eat more frequently than when that structure is perfected, which Buffon considers in man is not till near thirty years of age, although in women at about twenty years of age, because her structure is smaller than that of man. In this way, when arrived at full stature, but not at maturity, from eating more frequently, and altogether more in quantity, we have more stimulus and ardour, and abundance of seminal fluid, but that fluid not supplied by such abundance of organic living particles.

In Buffon's various experiments, his examination of the fœtus in rabbits, bitches, chicks in eggs under incubation, at the several different stages of their growth, he proves that the fœtus grows in similar proportion to what the animal grows after its birth; and alike in both cases, when near the time of its full stature, either as an animal, or the fœtus of one, they shoot out, and grow faster, in the same space of time, than at the more early stages of their growth; thus man, in the last year before he attains his full stature, grows more rapidly than at any former period of his growth, and in the same manner with animals. We know, from almost daily observation, that where young people are pre-disposed for consumption, that disposition manifests itself more generally at this period of their age, than at any former period. We also know that strong and healthy young people have more frequent hunger, and desire to eat greater quantities at this period than at any other, either before or afterwards; at this period, nature requires more support than at any other period in particular; and to be restrained from eating, or insufficiently supplied with food at this period, will very much endanger even those who are not previously pre-disposed for consumption, to become consumptive. At this period they should also have plenty of strong exercise, as that will rather check the growth in stature than otherwise, and will strengthen the parts the better to support what growth in stature does take place, and the additional food they eat at that period will support them in that stronger exercise. It is the same with animals intended for labour as with man in this respect; and this is the time more precisely than any other, when a growing greyhound puppy should have an increased quantity of *animal* food given to him, in small quantities at a time, but given frequently; and to have liberty to run about in the day, with any inducement you can adopt for him to gallop and race about, a moderate time before each feeding; the most probable method for that purpose is, to shut him up in his kennel for an hour or two after he is fed, which will assist the digestion of his food, after which his liberty is a greater novelty to him, and pleased with it he will delight himself with *scummering* about, as Gervase Markham terms it, and exert all his powers for awhile, which is of infinite service in strengthening all his parts.

If you feed puppies with household bread crusts or biscuits, they should be well soaked in the broth or milk in which they eat it before they are allowed to feed; for if not well soaked, when it gets into their warm and moist stomachs, it swells very much, and makes them more full and uncomfortable than when previously soaked. If you make bread purposely for them, it is quite as well to be of equal portions of wheat, barley, and oatmeal, giving a greater variety of nutriment; and in bread or thickening their broth, the meal should be of sound quality, whether coarse or fine; I have known puppies very much injured by thickening their broth or porridge with unsound meal or from damaged corn, which some people, when they unfortunately have such on hand, will feed them with, thinking it good enough for them; but if they set any value on the puppies, it is only penny wise and pound foolish to do so, as they look 50 per cent. worse in a very few days after feeding upon such food.

Unsound or putrid flesh is very hurtful to puppies; and if you give them good flesh it should be in small quantities at a time, not now and then a belly full of flesh, as the common term in use is, and also in practice a common custom; where they have much flesh at a time, it should be when they feed generally, or most days, on flesh; in such case they should have free access to the whey tub, to carry off in their urine any excess or superfluity from so much solid food; and on this account, if you quarter them with butchers, it is much better to do so in a village than in a large town; for although the butcher may not dairy, or make cheese to have a supply of whey himself, he has greater opportunity of having that accommodation from a neighbour; they have also fresher air, and generally more liberty to take their own natural exercise. The butcher should, however, have the puppy on such terms as will induce him to obey your orders not to take him out to course, which many have a great proneness to do, and thus what you would gain by country quarters, you lose by the puppies' too great *mental acquirements*, in being made cunning rogues before they arrive at the age of maturity, and are for ever afterwards worthless, except for the purpose of killing hares.

It is a singular circumstance that one man should rear many puppies, one at a time in succession, that have proved themselves first raters. Two or three before old Grasper were very superior to greyhounds in general; then Grasper; afterwards Harold, and next a son of Harold, who has never run in public, having unfortunately broken a leg, but is quite as fine a dog as Harold, and some say finer; also a son of the broken-legged dog is promising to make as fine and good a dog as his progenitors. Good new milk porridge, well thickened with wheat flour, with occasional bread, meat and bones, and free access to the whey tub, has been their general diet till about a year old.

Arrian says, p. 132, "As soon as the season arrives for taking out your puppies, let them first be walked over such roads as are rough; for this exercise is conducive to forming and strengthening their feet." The formation and strengthening of their feet require a much earlier attention than is here spoken of; as soon as they can run about, they should have a good floor or yard to play in, where there is no straw, as straw is a bad thing for making their feet long and open where there is much of it; and if you let their feet get open, which they soon will do if confined to be upon straw, you can never recover a good round cat-like foot afterwards. Their toe nails should be occasionally pared, which makes their nails stronger.

Some coursers will let their puppies have their full liberty throughout the day, conceiving that they cannot have too much exercise, such as they take of their own accord; and this to a certain degree is right. But when they are at liberty the whole day, it is no novelty to them, and they do not frolic and frisk about, and race with each other, as when they are confined a portion of the day; they do not exert themselves so as to keep gradually strengthening their parts, and extending their powers, and stretching their muscular fibre, which promotes their growth, each succeeding week, as more confinement, and their liberty a greater novelty to them, would induce them to do. They may undergo as great a portion of exercise with two or three hours' confinement in the middle of the day as if at liberty the whole day, and that exercise of a more beneficial quality, conducing to a gradual but greater extension of their powers and muscular strength. This, however, should not be attempted while their limbs are in too gristly a state, but as they become more bony and firm. Care, however, should be taken when they are at liberty out of doors all day, that they should also have liberty to go in again when inclined to do, and especially in cold weather; for no benefit whatever can be derived to so fine and delicate an animal, so partial to warmth as they by nature are, from sitting shivering and chilling out of doors for hours together, as nothing is more likely to check their growth, and make them spiritless when once in doors and not inclined to go out again.

Some coursers hold it objectionable for two greyhound puppies to be brought up together, as they run round each other in their play, meet and dodge, and so forth, which has a tendency to learn them to lurch; but this cannot well be avoided without losing the benefit of exercising and exerting their growing powers; yet with their liberty all day, when they do play it is generally in that manner; while with some confinement in the day, when at liberty they are more prone in their play to race wider distances, and have less meeting and dodging about, thus giving better exercise with less danger of learning them craft; if you begin this when six or eight months' old, there is no danger of injuring their limbs. You may confine them part of one day in a week for a week or two, then part of two days in a week, and so on; the more they get used to racing, the fonder and more eager they will be to do so.

I know a very high bred dog, which was well fed when a whelp with new milk, but running away from quarters, and being twice lost in that way, his owner had him home, where he had not the convenience of a secure yard to let him run about in, but was confined in a small kennel, except when his owner had opportunity of taking him out for an hour or two, which he did most days, and sometimes more than once each day, so that from four or five months' old he had not near so much exercise as he ought to have had; he is lengthy and good in his back and general shape, but so sadly straitened and confined in his chest, that his running is not what might be expected from so fine and high bred a whelp.

Being confined in his chest, consequently not having sufficient room for the action of his respiratory organs, he is so much sooner distressed for wind; while having plenty of liberty, and running freely about when young, have a tendency to make his chest expand, giving more room for the action of his lungs, and also strengthen the muscles of the lungs, which require strengthening equally with those of the limbs. If you could induce puppies, when first let out in a morning, to have a short race up a hill, and as they get older increase the distance they run, it would have a very beneficial effect in expanding their chests.

A timber fence between two crofts, or in the middle of a long yard, about a yard high for young puppies, and made higher as they grow older, secured so that they cannot creep under or through it, and something similar between their bed and that part of the kennel where they are fed, for them to leap over to get to their food, not only learns them early to top fences when wanted to course, but the act of leaping over assists in stretching their muscular fibre, and strengthening their parts very much. They should not be small low gates in a confined kennel yard, such as I have seen, merely to learn puppies to top fences, which constitutes only an apology for exertion, and suitable enough for cats to hop over; they should have room for length of run, and to *fly* over the fence, not to hop over, to be the beneficial exertion required for the purpose.

Quartering the puppies out one at a house amongst the farmers or butchers in the country, is certainly much better than having them in the kennel at home, especially where you have many of them; for in the latter case, they neither get so much or so good exercise, nor so much variety of food, which is very desirable; nor do they come in for so much bone, which is indispensable to their strength and courage, as a part of their food. On the other hand, if you quarter them with farmers, it is equally desirable that it should be where there are very few hares; in such case, the puppy going out with the plough boys and men, it gets very good and proper sort of exercise in the fields, and plenty of it; but if there are many hares, it will be utterly ruined for any chance of winning cups, or distinguishing itself at a public coursing meeting, any other way than as a cunning rogue, that excels in craftiness, in which some are indeed most excellent. But the mischief does not end here; so much exercise of their mental faculties strengthens them to such a degree, that it affects their offspring, and gives rise to the common observation that they are a crafty sort. I have not the smallest doubt that many greyhounds are considered to be of this sort, which are of as true greyhound blood as any greyhound we have, and from no other cause than their progenitors' too great exercise of this faculty by being coursed often when too young; and I know nothing in a greyhound so desirable to be avoided, or so difficult to steer clear of, as these mental acquirements.

I have, in the early parts of this volume, on the subject of the necessity for plenty of exercise while young, properly to develop the muscular and bony structure, alluded to a well bred bitch establishing herself so good a constitution by being quartered where there were many hares, and coursing them very frequently before she was one year old; her puppies generally are crafty at an early age; but that I have principally attributed to their owner's proneness to course them frequently when eight or nine months old; some of them have killed many a hare before being a year old. I have, however, one particular instance in a young bitch bred from the same old bitch, which clearly shows the craftiness to be, in some measure, if not wholly, hereditary; the question is, whether that is from being of a cross, or of a pure unmixed breed; or from the exercise of the mental faculties of the parents. Every indication by the shape, fineness of head, stern, and coat, with the well known pedigree for many generations being of a good sort, will not admit of the conclusion that she was otherwise than of as pure greyhound blood as any greyhound I know; the conclusion therefore is, that the craftiness so early displayed by this young bitch, is from the exercise of the mental faculties of her dam, her sire never having been known to display that propensity in any one instance.

This young bitch was quartered at a farmer's, where there was scarcely a hare in the parish, and had been kept from coursing till about eighteen months old, and for the remainder of the season was coursed very little. She had been well fed at quarters; plenty of good exercise with the men in the field most days, was as fine and symmetrical in her shape and general appearance, and displayed as fine muscular development as any greyhound that was ever brought into a coursing field. Yet with all these advantages against the march of intellect, she was quite crafty in her second season of running. If Mr. Drake could but instil some of his patience and forbearance (in not coursing his greyhounds till between two and three years old,) into the minds of some of our celebrated coursers, they would have their greyhounds run honest for a greater number of seasons, and then breed such as would do the same.

Some people will not learn by precept, conceiving too high an opinion of their own knowledge, until they find themselves wrong by further experience. I have, for the last twelve months, been cautioning a coursing acquaintance, who is a butcher, against his young whelps eating the raw foul offal in his slaughter-house yard, where they are kept, as being likely to pre-dispose them for distemper. A very good bitch pupped eight or nine whelps two or three months ago, which were suckled in a kennel in this yard, in which they occasionally ran about, and of course ate, as well as their dam, of the offal lying in it. As I returned from the printing-office with this proof sheet in my pocket, past the yard, he informed me that all the puppies were dead except one, which was the first that was taken from its dam. "I am satisfied now," said he, "that it is the offal; but we had no milk, and what could we do?" I leave my readers, and the butcher also, to draw their own conclusions, and with stating this fact, in confirmation of the doctrine in the foregoing pages, so opportunely come to my knowledge, I will close the chapter on rearing.

TRAINING GREYHOUNDS.

MY GREYHOUNDS.

> " Rememberest thou my greyhounds true ?
> O'er holt or hill there never flew,
> From leash or slip there never sprang
> More fleet of foot or sure of fang."
>
> *Introd. to Marmion.*

In feeding and exercising greyhounds in order to produce them in the best possible condition for the purposes of chase, there is a peculiarity in their performances which should not be lost sight of, differing from those of the horse, or the more dignified animal, man. This peculiarity is necessary to be observed, for though the strength and wind of the animal may be naturally good, yet all his efforts may be rendered null and void without this point is kept in view. The race horse, for instance, is restrained by the bridle and the skill of the jockey from expending his powers unnecessarily, and should the utmost exertion of speed be required, the rider gives an additional impulse, first by the hand, and lastly by the whip and spur; but in the greyhound, the position is quite different. The animal, under the full influence of his peculiar instinct and propensity, and perfectly uncontroled by human power, the moment he is slipped at a hare, exerts the full force of his physical powers, straining every muscle to reach the object of his pursuit, nor does he cease to do so during the whole of the chase. Thus the strength of one is reserved for a final struggle, while in the other the whole animal fibre is at once on the stretch. It will be evident, that what is termed spirit, animation, or more properly fire, is a most essential quality in the greyhound; the first run up to the hare is frequently the only opportunity of judging of the relative speed of the two contending dogs, for quite as many wagers are depending upon that event as on the winning of the whole course; if one dog waits, as it is termed, and saves himself (which some will do) either from being dull and stiff, or from overflesh, undue exercise, or other causes, and the other dog is free from these imperfections, and does his best, the latter is gaining the points which count against his opponent in the summing up of the whole course, should that even be a long or severe one; but should the hare prove a bad one, or only moderately stout, the course is over before the waiting dog gains any points; thus had his powers been brought fully into action at the onset of the course, the waiting dog might possibly have won it. Therefore feeding becomes a matter of first-rate importance, only surpassed by the physical superiority of the dog himself.

If you feed a dog with a sufficient quantity of nutritious food to make him superabundantly fat and fleshy, you are obliged to give a corresponding quantity of severe exercise to reduce him to a standard of health and fine muscular development, while you unload his chest of superfluous fatty matter, in order to increase its capacity, and consequently improve his wind. In producing this fine state, and during the process required, the dog necessarily becomes dull, and stiff in his joints, and he is *(pro tempore)* deprived of that essential quality, fire, I have before spoken of.

A greyhound, in tip-top condition, should be all fire, animation, and sprightliness; his gaiety expressed in the sparkling of his eyes, and the bounding elasticity of his limbs should be so refreshing to the beholder as to produce the idea, that the excellencies of the animal could be carried no further; so that a combination of the greatest strength from large muscular development should be united with the best state of the wind to produce what is called fine condition; to attain this very desirable end, the animation of the animal should not be depressed by undue exercise, which frequently deprives him of the âcme of his speed as well as fire.

There is a chain of circumstances connected with the training of greyhounds, which requires great nicety in the handling, so as to be prepared for contingencies as they present themselves. "Great muscular development," says Dr. Ferguson, "is absolutely necessary in the greyhound, more so than in other dogs of chase; the bones may be considered merely as levers, acted upon and moved in various directions by the contraction and relaxation of the muscles which are inserted into them; and as the fleshy portion of the muscle is the only contracting and relaxing part, it is quite manifest the more bulk you produce the greater momentum or propelling power will be given to the animal. The tendonous part of the muscle has nothing to do with action, possessing no irritability or power of contraction. In all animals where the bone is large, the tendonous fibre is well and fully described.

"Dogs as well as horses may be overtrained; too much exertion, long persisted in, appears to destroy the vigour of the animal by exhausting his powers. The mind of man overstretched by study is rendered weak and feeble—it is the same with the body—great exhaustion is attended by great debility—the measure of debility is in exact proportion to the measure of exhaustion."

In order to provide for this combination of circumstances, and to prepare the dog for coursing in the finest possible state of condition, there is a variety of considerations to be taken into account, some of which require the most minute attention to be thoroughly understood; but when the nature of the animals, with their habits, propensities and powers, is duly considered, together with the operation of the different kinds of food on their stomachs and general system, the practice, to an intelligent mind, becomes simple and easy.

Each sportsman has his favourite system of feeding them; and the food given is of different sorts, affording different degrees of nutriment, and of different degrees of digestibility; flesh and bone, gelatinous and farinaceous substances, and liquids with more or less nutricious matter contained in them; some feeding but once in a day, while others, to avoid over distending the stomach and oppressing the agencies and organs of digestion, commit an error in the opposite extreme, by giving only half a meal at a time, and that twice in a day; this is practised by those who affect to make nature their guide, and who give but little solid food, preferring gelatine and farina as being easier of digestion in a dog whose stomach will digest bone itself; and supposing that there is the same nutriment, or nearly so, contained in the flesh, and broth boiled with it to a jelly, as was originally contained in the flesh itself; whereas a great portion of the nutriment goes off by evaporation, and you lose quantity as well as quality: the greatest portion of nutriment is contained in the flesh when raw; it loses a portion by being only parboiled—and still more if completely boiled through; but when boiled till the broth becomes jelly when cold, a very great portion of the nutriment is evaporated and lost. In addition to this, giving only half a meal at a time, and that of easy digestion, is injurious to a healthy dog. "It is proved," says Dr. Teulon, "that jelly alone will not support the life of a dog," and, says Dr. Ferguson, "it proves what most old sportsmen are aware of, that the trencher fed dog is always in the best health, his food being composed of a happy mixture of flesh and bone: bone would appear to be quite as necessary for the dog as sand and gravel are for the fowl.[1]

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[1] That these substances are necessary for dogs and fowls, there requires no further proof than their instinctive desire to eat them; nevertheless their uses are not alike in each; sand and gravel for a fowl being merely a mechanical agency and assistant to the *mill* with which nature has furnished them to grind and break the husks and kernels of corn, but nowise nutritious, or forming a necessary agent in digestion; whereas bone contains much oily and nutritious matter, and is otherwise serviceable to the dog. He is provided by nature with a stomach of great capacity in proportion to his size, and the probability is, that he was destined to endure, without suffering weakness or injury, with only one meal a day, his natural food possessing different degrees of digestibility, of which bone is proved to remain the longest time on the stomach, thereby preserving it from exhaustion for want of more food for a longer time than any other food which he eats, which circumstance alone enables his stomach the better to perform its functions without loss of energy when he again fills it, though such may not be of twenty-four hours or more after his former meal.—The dog's evidently peculiar instinctive desire to eat bone, proving its being a natural and

"The digestion of the dog, or rather the digestive process in the dog, goes on most rapidly, and the absorbents are very active in conveying the nutritious fluids, which eventually enrich the blood and fatten the animal.

"Although a large quantity of jelly may contain quite as much nutriment as a given quantity of animal food, yet I consider that the meal is not only an unnatural one, but attended with its disadvantages;—first, few animals have so large a secretion from the salival glands as the dog, which, in the mastication of food, is freely poured out, and enters largely into the general mass of indigested food, rendering the task which the stomach has to perform not only less troublesome to it, but positively necessary to the production of the chyme, which, in the duodenum, is converted into chyle, and passes on to the circulation; thus a process of nature is refused to digestion, and can be productive of no good, but, in my humble opinion, of absolute loss to the animal: secondly, the stomach will not only become relaxed, but its functions injured by thus breaking in upon the natural and regular routine of its daily business.

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congenial food to him, may admit of a rational supposition that its presence on the stomach is attended with another benefit to him, namely, that the presence on the stomach of the oily matter, liberated by the bone being crushed, when he has just eaten a full meal of other food, assists in renewing the nervous energy of the stomach by nourishing it, and thereby contributes to the easier and better digestion of such other food. If this be correct, dogs in training should always have a proportion of bone when a full meal of solid food is given to them.—As a further proof of the dog's instinctive desire to eat bone, I had two greyhound whelps, which were taken from their dam when only three weeks old; the day they became a month old, a small piece of bone was given to one of them at the time they were feeding on new milk, bread crumbs, and sugar; the other whelp perceived the bone and seized fast hold of it, when a complete struggle took place between them for the bone, leaving their other food, till they had disposed of the bone; at length one secured it to himself, and lay down with the bone between his fore feet, gnawing away at it with his little teeth just in the manner an old dog would do, till he had eaten it, and then turned to his other food. To this I was an eye witness.

"Animal jellies, rendered sufficiently liquid to be lapped, would certainly tend to increase the vigour of the dog, *in degree*, even after a full meal, or a half meal, or any portion of a meal, or between meals—isinglass jelly *less* than any other. Ox or cow-heel boiled or stewed till the tendon separates from the bone, would be productive of more strength than if the process of stewing were carried on still further, or into a state of jelly, for the reasons I have before assigned—the process of digestion in a dog goes on so rapidly, *more particularly at rest*, that I have no doubt the dog would derive more strength from warm animal food than any quantity of jelly you could force him to take, and his strength would be better supported notwithstanding he could not be fed till night, and have to run the next morning."

In the latter case it, of course, would not be advisable to give a full meal; but in those times where you are at liberty to feed him any part of the day, he says, "I should prefer one good meal, inasmuch as the animal usually enjoys an uninterrupted rest, and reaps all the advantages you desire from repletion—give him only portions of a meal, he becomes restless and anxious for more food—the inference is clear and requires but little consideration to prove the advantages of a full meal over a partial one: provided the dog had previously been at work, I should still feed him with flesh on that day, knowing that he had to run the next day but one—and on the intervening day I should give him warm flesh, with a proper proportion of farinaceous food—without cow-heel—an early but a full meal. Warm food is a restorative, and, by directly stimulating the stomach, is most desirable to the harassed and jaded animal."

It is not to be supposed that he means by "a full meal" that you should give a voracious eating dog all he would gormandize, as by doing so you would not be able to get him into good wind without so much severe exercise as would deprive him both of his necessary fire and the acme of his speed. Neither is the nature and quality of the food to be disregarded, as what is applicable and useful for one dog, is, on the contrary, injurious to another. On this subject he says, "I should think it very difficult to lay down any thing like general principles in the feeding of dogs, so as to reduce it to a system; for I have no doubt that idiosyncrasy or peculiarity of temperament is quite as remarkable in dogs as in man, of which I have had abundant proofs; thus fat will agree very well with a dog whose appetite is morbidly large, which to a dog whose stomach is delicate would be offensive; the erculations succeeding the swallowing of fatty matters, evidently tend to produce dyspepsia in dogs, which is soon cured by fasting; independent of all this, I see nothing gained by fat, as it only comes to a question of nutriment after all, and the clean flesh is best. Although liquids may leave the stomach harmless, it is desirable that dogs should not be pressed to take more than is absolutely necessary—supposing the liquids mixed with animal jelly, the circulation becomes oppressed, inasmuch as you break in upon the balance of the circulating fluid (blood) consequently as dogs do not throw off superabundant matter by the skin during violent exertion, it can only be got rid of by exhalation, which is proved by the constant lolling out of the tongue of a fat dog." This subject will be further considered in the after pages.

Some dogs eat voraciously; others with delicacy; but it is a slovenly method to feed a number of greyhounds, and especially when in training for coursing, at one trough; you may, it is true, form some opinion when each has had as much as you wish, when standing by them, if they are not shy at feeding together, by judging of their apparent fulness, but you cannot even do that so accurately as if each dog were fed in a separate trough; the eccentricity of their temperaments should be attended to. Dr. Ferguson states a curious instance in his allusion "to some feeding better with another dog—while others will not feed at all in company—a friend of mine," says he, "at Walsall, Mr. Day, has a large spaniel which will look shy at the most dainty meal, and after smelling, will retire from it—call out in a loud voice—'*I'll have it*'—he flies at the dish with a growl, and devours its contents with greediness."

I am not aware of any description of sporting dog more prone to shyness than the greyhound, and those most so which are of the highest and purest blood, to which delicacy of appetite is equally applicable; an exceedingly delicate feeding greyhound dog is of very little value, less than bitches of that description, as the latter are influenced in their feeding more by causes incidental to their sex than the former. Very few, if any instances, can be adduced of good puppies being derived from a delicate feeding dog, the best being generally from those of a robust and hale constitution, and therefore the delicate feeders are worthless to breed from; and though true that some of them are remarkably speedy, and will run one moderate course, possibly beating a really good dog, yet a very severe course is too much for him, nor can he come again for a second or third course equally with a well bred good feeding dog. Such dogs, to have them fit to run one tolerable course, must be fed as often as you can entice them to eat, and of that sort of food of which they will eat the most; it is very rare that they will eat much flesh or nutritious food; their stomachs are deficient in the power of digestion, and as Mr. Cade observes, "you must prepare their food *for their stomachs*, such as is easy of digestion; the more robust free feeding dog's stomach will prepare the food itself, for its further progress into the animal system." The inference why they cannot come again for a second or third course is quite clear; they cannot take a *quantum sufficiet* of stimulating nutriment on their stomachs to support their strength for continued violent exertion. Hence we may derive an incontrovertible proof of the indispensable necessity for giving a preference to animal or solid food over gelatinous or farinaceous substances, to a certain or given degree.

This leads me to the consideration of what is termed "good wind;" as it will be found strikingly applicable to the want of muscular strength in a delicate feeding greyhound. The organs of respiration are affected in different ways; first, by the stomach being loaded; secondly, by the circulating fluids being oppressed by improper food or in improper quantities, indigestion, or not being conveyed in the regular and natural course into the system, or from want of exercise the chest is not cleared of fatty matter to allow its full and free expansion, nor are the muscles of the respiratory organs strengthened by violent action, which they require to be equally with the muscles of the limbs; and thirdly, by exhaustion. In the very first instance, the organs of respiration are not so much affected by what dry food a moderately free feeding dog will eat without liquids, as with them; "the distension of the stomach by water or other liquids impedes the ascent of the diaphragm, and oppresses the action of the heart and arteries, at the same time preventing the full and free expansion of the lungs."—*Dr. Ferguson.*

Dr. Quincy's Lexicon-Medicum, revised by Robert Cooper, M.D. and published in 1811, will explain the principle of digestion, and afford some instruction to trainers of greyhounds how to alter their mode of treatment according to the variety of circumstances to which their attention is frequently called, an extract from which will also tend to elucidate the point here more immediately in question.

"*Gastric juice—succus gastricus*—a fluid separated by the capillary exhaling arteries of the stomach, which open upon its internal surface. The œsophagus also affords a small quantity, especially in the inferior part. Modern philosophers have paid great attention to this fluid, and from their several experiments it is known to possess the following properties.[1] It is the principal agent of digestion, and changes the aliments into a kind of uniform soft paste; it acts on the stomach after the death of the animal. Its effects show that it is a solvent, but of that peculiar nature that it dissolves animal and vegetable substances uniformly, and without exhibiting a stronger affinity for one than for the other. Although it is the most powerful agent of digestion in the stomach, its dissolvent power has need of assistance from the action of several secondary causes, as heat, which seems to augment and concentrate itself in the chigastric region. So long as the exertion of the stomach continues, there is a sort of intestine fermentation, which should not, in its full sense, be compared to the motion by which fermentative and putrescent substances are decomposed; there is also a moderate and peristaltic motion of the muscular fibres of the stomach, which presses the aliment on all sides, and performs a slight trituration, while the gastric moisture softens and macerates the food before it is dissolved. In quantity it is very considerable, as must be evident from the extent of the surface of the stomach, and its continual secretion; but it is most copious when solicited by the stimulus of food."

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[1] It does not appear that gastric juice has occupied the attention of physiologists for any long anterior date to the present, even if its existence in the stomach were known to any one. The system of digestion was considered very different in former times to what it is now. Magendie says, "The ancient philosophers said that food became putrified in the stomach; Hippocrates attributed the digestive process to coction; Galen, A.D. 131, assigned to the stomach attractive, retentive, concoctive, expulsive faculties, and by their help he attempted to explain digestion. The doctrine of Galen reigned in the schools until the middle of the seventeenth century, when it was attacked and overturned by the *fermenting chymists*, who established in the stomach an *effervescence*, a particular fermentation, by means of which the food was macerated, dissolved, precipitated, &c."

"This system was not long in repute; Boerhaave and Haller set up other systems of digestion equally illusory. At length Reaumer and Spallanzani made experiments on animals, and demonstrated the falsity of the ancient systems, and proved that the stomach contains a particular fluid, which they called *gastric juice*, and that this fluid was the principal agent of digestion."

Under the head Digestion, he says, "The change that the food undergoes in the stomach, by which it is converted into chyme. The circumstances necessary to effect a healthy digestion of the food are, 1st. a certain degree of heat of the stomach; 2d. a free mixture of saliva with the food in the mouth; 3d. a certain quantity of healthy gastric juice; 4th. the natural peristaltic motion of the stomach; 5th. the pressure of the contraction and relaxation of the abdominal muscles and diaphragm.[1] From these circumstances the particles of the food are softened, dissolved, diluted, and intimately mixed into a soft pap, called chyme, which passes through the pylorus of the stomach into the duodenum. The fluid, which is termed gastric juice, is separated by the minute arteries opening into the cavity of the stomach. The gastric juice producing great properties of solution, penetrates into the alimentary matter on all sides, separates and divides its particles, combines with it, changes its composition, and impresses qualities very different from those possessed before this mixture. The power of the gastric juice is sufficient to reduce to a soft mass the hardest bones, on which certain animals subsist. The aliment remains a greater or a less time on the stomach, agreeably to the facility or difficulty of the necessary changes taking place. Gosse, of Geneva, has proved on himself, that the animal and vegetable fibre, the white of an egg boiled, white and tendonous parts, paste kneaded with butter, sebaceous substances, and those things which were not fermentative, or very little so, made greater resistance to the gastric juice than the gelatinous parts of vegetables and animals, fermented bread, &c. did; that the latter class of substances required only an hour for their complete dissolution, while the digestion of the former was not completed at the end of several hours.[1]

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[1] Magendie says, "The circumstances affecting the food in the stomach are not numerous; 1st. it suffers a pressure more or less strong, either from the sides of the abdomen, or from those of the stomach; 2d. the whole is entirely moved by the motion of respiration; 3d. it is exposed to a temperature of 100 to 104 degrees of Fahrenheit; and 4th. it is exposed to the action of the saliva, and the fluid secreted in the mucous membrane. This fluid is slightly viscous, containing water, mucous, and salts, with a base of soda and ammonia, and a portion of the lactic acid of M. Berzelius."

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[1] By this it appears, that the animal fibre, the white and tendonous parts, are the hardest of digestion, as they make the greatest resistance to the gastric juice; this applies to horseflesh in comparison to beef or mutton; also to cowheel; horseflesh generally is full of ligamentous substances, being made so by labour; cowheel, which is tendon itself, would be very difficult of digestion if taken on the stomach in its raw state; but when prepared for the stomach by the action of fire and water, it is reduced into a pulpy and gelatinous mass, and is then more easy of digestion; horseflesh, after being boiled, as some dog feeders boil it for eight, ten, or twelve hours, is deprived of its nutritious properties, except that portion of it which is ligamentous, and that is so small a proportion to the fibrous part, that the latter would do more harm to the stomach than the former would do good by its small portion of nutriment, and would be more profitable on the manure heap than on the dog's stomach; it would be only throwing away a small portion of nutriment to avoid a greater evil; you have extracted the good from it into the broth, which is useful to give with bread and gelatine; but the fibrous part of the flesh containing no nutriment, only tends to overload and distend the stomach, offering great resistance to the gastric juice, occupying a valuable portion of it, which would otherwise be operating

"During the time of digestion, both orifices of the stomach are closed; no gas, disengaged from the aliment, ascends through the œsophagus, unless in cases of bad digestion; slight chills are felt; the pulse becomes quicker and stronger, and the powers of life seem diminished in some organs, to be carried to the seat of the digestive process. The parietes of the stomach soon begin to act; their circular fibres contract in different parts of its extent; these peristaltic oscillations, at first vague and uncertain, become more regular, and are directed from above downwards, from left to right, that is, from the cardia towards the pylorus; its longitudinal fibres also contract, and thus approximate both terminations. In these different motions, the stomach becomes parallel with the pylorus, and the angle formed by the duodenum is almost totally obliterated, which renders the passage of food easier.

"The aperture of the pylorus is furnished with a muscular ring, covered by a duplicature of mucous membrane; this kind of sphincter keeps it closed during the time of digestion in the stomach, and does not give passage to the aliment until it has undergone a very material alteration. The pylorus, possessing a peculiar and extremely delicate sensibility, may be considered as a sort of vigilant sentinel, that prevents anything from passing that has not suffered its proper changes. Many authors quoted by Haller have been well aware, that the food did not pass from the stomach successively in the same manner as it was received, but agreeably to its greater or less facility of digestion.

"It would appear, that there is a real selection of food in the stomach, for those aliments that admit of an easy digestion are directed towards the pylorus which gives passage to them; while, on the contrary, such as are not sufficiently digested, are not permitted to pass, but kept back in the stomach."

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on the best and most nutritious parts of the food, thus impairing and obstructing digestion in a great degree, without any countervailing benefit. If a trainer of greyhounds would feed a dog for a week on nothing else than this fleshy fibre after having been boiled to such a degree, he would soon be convinced of the inutility of giving him any portion of it with other food.

Dr. Teulon, an experienced courser, first suggested to me that "a dog ought not to have fluids of any kind given to him with solid food;" as the broth, or whatever liquid it may be, dilutes the gastric juice, upon which, as the late Mr. Abernethy has justly observed, almost entirely depends the solution of the food. The Doctor also recommends flesh, particularly mutton, preparatory to coursing, rest for some hours after feeding, and to lie warm. An experienced courser says, "as to quantity of food, I think about seven or eight ounces of beef or mutton, half dressed, twice a day, sufficient; and it is well to vary the food, giving an equal quantity of oaten bread instead of flesh occasionally; but I would feed principally with flesh; with respect to exercise, I think a gallop of two miles a day the best, but should it not be possible to get ground to gallop on, he may be taken on a road eight or ten miles a day, four or five in a morning, and the same at noon, part of which he ought to go on a smart trot."

Nature is our safest guide; so in the quantity of food best to be given to a dog for the stomach to perform its functions to a complete digestion of aliment upon it, whether that aliment is easy or hard of digestion, there is a tolerably good criterion to be gathered from the dog's inclination to lap water, of which he will lap no more than quenches his thirst, while of broth or other nutritious liquids he would lap more than is necessary for that purpose, and therefore accordingly as he laps water in quantity some time after having a given quantity of food, so may you regulate your future feedings of him. Mr. Terry says, "If too much food has been taken, the mucous membrane of the stomach will cease to secrete the gastric juice; hence thirst; if you distend the stomach with liquids at the same time as you give animal food, those liquids must in some measure be disposed of by the digestive powers before the gastric juice can be again sufficiently secreted to act upon the flesh; the powers of the stomach are debilitated, and therefore unequal to a second task, especially so soon imposed; besides, animal food commands the greatest exertion, and therefore the stomach should be in its most fit state for digestion when it is taken; the juice being then ready for its reception, and the constitution expecting it for nourishment, all goes on in its proper course; chyle having been formed, it is then that nature invites to healthy exercise. The plan to strengthen the frame most effectually is to give flesh alone; that rest after eating is necessary cannot be doubted; after the food has undergone its changes, nature invites to exercise."

It would certainly tend to strengthen the frame most effectually to give flesh alone, as then the whole agency of digestion would be directed to it, and flesh is more strengthening than gelatine or farina; but to feed a dog wholly on flesh in plenty, he would become heated and foul in his habit, mangy, and other bad consequences; flesh with gelatine and farinaceous substances, the latter either dry, or mixed with liquids to a consistency of pudding, have no bad effect in any degree of comparison with liquids in a fluid state being taken the same with flesh, as these materially weaken the whole flow of gastric juice, while to the former, in a consistency of pudding, there is only the proper portion of the gastric juice directed, the flesh partaking of its own portion in its original strengthy state; the inconvenience from a full meal of such food is much more than counteracted by a happy mixture of food of different degrees of nutriment, and also different degrees of digestibility, as one part goes off and relieves the stomach of part of its load before other parts of the food are digested, which is not so much the case if fed wholly on flesh, and the greater variety of aliments strengthens the dog more than if fed a full meal of only one sort of aliment and of one degree of digestibility.

Good wind and muscular strength may be deemed *twin brothers* in a greyhound's condition, neither being of any avail without the assistance of the other; nor can either be in a state of perfection without the food going through its changes in the regular and natural course; the digestion in the stomach is the first and most important part of its progress.

Of the importance of Dr. Teulon's suggestion, of not giving liquids and solid food at the same time, I am thoroughly convinced; and although doctors will differ, and they do upon some questions appertaining to feeding greyhounds, yet upon this point they are unanimous.

I must here introduce an anecdote of a medical friend and brother courser, whom I was consulting on this subject, after its having been previously suggested to me by Dr. Teulon, and confirmed by Mr. Terry, both old coursers, and my own subsequent experience of the good effects from the system; this friend, whose dogs I had often noticed being in good wind, not with their tongues lolling out *before they run*, as some greyhounds are seen—but theirs are very soon up *after* a severe course. I asked him the plain simple question whether he gave his dogs liquids at the same time they had solid food; he evaded the question, and went on with explaining the other parts of his treatment; I asked him the same question again, and he again evaded answering it: as the third time is said generally to pay for all, I brought him to the point a third time, when he acknowledged that he *did not* give liquids and solid food together; and that when preparing for coursing, he shut his dogs up in the kennel (being at other times generally at liberty) and fed and managed them entirely himself for a few days previous to the coursing day.

"But," says he, "you ought not to tell people this; let them find it out themselves, or we shall have no advantage over them." "No, no," said I, "that will not do for me, I shall soon give publicity to every information I can collect on the subject; it may, it is true, be letting the cat out of the bag, but I have nothing to do with the secrets of the doctor's shop." This reminds me of an old courser, of the medical profession, being called upon to decide a course, and the owner of the losing dog complained of the decision, being, as he thought, wrong; the doctor offered to give his reasons for the decision he had made; "No, no," said the other, "none of your reasons; you may give a man a dose of physic, which I do not doubt would do him good; but if you tell him what it was made of, it will perhaps make him sick."

Markham very justly observes, that "nature taketh to herself an especial prerogative;" which applies to a variety of cases. "The true theory of digestion," says the Hygeist, "has been explained in 'the origin of life,' as being performed by the gastric juices furnished from the blood. Thus it happens that we are never hungry and thirsty at the same time. If hungry, we should eat, but not drink; and vice versâ, if thirsty, we should drink, but not eat. If a person cannot relish his meal without drinking, he may be sure that his digestive juices want correcting. If, on eating, you drink immediately, and add unnecessary liquids of any kind, you thereby materially injure and diminish the power of those digestive juices, and consequently impede a good digestion. When the aliments are once saturated in the digestive juices, thirst may begin, when you may drink with pleasure and benefit."

It is the same with the dog as with man; much would have more; if you allow him to drink when he eats, he will require to drink a greater quantity afterwards than if he had not drank while eating his meal, or for some time after it. When greyhounds are given to run to every ditch or pool they come near to lap water when on the road to the coursing ground, you seldom see them run well, though you prevent them from lapping water at the places they would run to; and you may rest assured that when they show that indication to drink, the previous day's management of them has been improper. The way to keep them from being thirsty, though you give them what is termed a full meal of food, is not to overload their stomachs, but to let them leave off eating with a small degree of appetite, and give them no liquids till a few hours afterwards.

I have had several trials of greyhounds under this system of what I may term *dry feeding;* every one of which has convinced me of its undoubted utility. One instance I will briefly mention. Two bitches, about eighteen months old, had a good long course with each of three old hares, weighing together twenty-seven pounds, besides a short one with a leveret, all of which they killed in about one hour; their tongues were up almost immediately after each course, and after killing the four hares, they appeared ready to run and kill as many more; in fact, their condition was such as created the admiration of several old coursers who witnessed it.

The cause is simply, that solid food taken without liquids, until that food is reduced to a proper state in the stomach, does you so much more good, and supports your strength so much better, than if liquids be taken at the same time with solid food. The difference in the strength and fineness of wind, would surprise any courser who had never noticed it, if he ran two dogs together that had both been fed of equal quantities of solid food, to one, liquids given in plenty, and to the other none for two or three hours afterwards; he would find that the next day the one fed without liquids would be in much better wind than the other. Another remark he might make of the difference in the effect in their thirst three or four hours after their being so fed; offer them both what water they will lap, and he would find the dog that had taken no liquids with his food would be the least thirsty, and would lap the smallest quantity of water.

The objection to liquids is more particularly applicable when flesh is given in plenty, than when only farinaceous or digestible food is given; even when flesh has been given, after it has undergone its first process of digestion, say after two or three hours' quiet rest in a warm kennel, liquids in moderate quantity will be serviceable; I, however, doubt the utility of then giving those liquids which are highly nutritious, after eating plentifully of food of like quality, and am supported in this idea by Magendie. In nutritious liquids, the water contained in them is separated from the nutriment in the stomach, the former soon passing off, and the latter in regular course is converted into chyme, this nutriment prolonging the time the stomach is loaded, and consequently requiring more time to elapse before the dog is fit to run. "Whereas," says Magendie, "those liquids that are watery, soften, divide, dissolve even certain foods; they aid in this manner their chymification and their passage through the pylorus." In this way water is useful in a few hours after a full meal, as the food has then undergone a part of its process towards chymification, and is in a state ready for the assistance of any liquids which may enter the stomach.

Water, toast and water, small beer, and such like, are frequently drunk at dinner as being thought better than stronger liquor; whereas, if taken in quantity, they are the worst for the stomach, and the digestion of the food. Old strong ale, possessing much alcohol, is better, and if only a small quantity be taken, it will assist digestion; two or three *small* wine glasses of good sherry wine during dinner (not more than three, and those small ones) are better than ale; the latter, taken frequently in hearty draughts, is very prejudicial to digestion; the quantity of either is a great desideratum; a little assists, while a large quantity prevents digestion. Magendie says, p. 282, "Wine fulfils analogous uses, but only for the substances that it is capable of dissolving; besides, it excites by its contact the mucous membrane of the stomach, and causes a greater secretion of the gastric juice. Alcohol (brandy) acts much in the same manner as wine, only it is more intense. It is thus that those liquors which are used after meals are useful in exciting the action of the stomach."

Thus if an amateur of coursing be inclined to treat his dogs immediately after a full meal of solid food with a glass of sherry wine popped down their throats, it would have no bad effect, but on the contrary it would assist digestion, and in a two-fold manner; first, by increasing the energy of the stomach, and secondly, by the alcohol contained in it soon getting to the brain, would tend to make the dog drowsy and quiet, so that digestion would go on more easily by rest; while if too great a quantity were given to him, it would create more subsequent thirst; the quantity given of either is the main desideratum; if a full meal of solid food be given, a small quantity of liquids may be no detriment to digestion, but rather a benefit if strong liquid; while a large quantity of any liquid is detrimental to the digestion of a full meal, and of strong liquid it is so in a two-fold manner; first, by weakening the gastric juice the same as brandy would be weakened by adding water to it, and secondly, by its operation on the brain, causing the dog to sleep soundly, which sleep of itself in some measure retards digestion, while rest and ease promote it. If on the contrary a dog eats but a moderate quantity of food, a larger quantity of liquids has not so detrimental an effect upon digestion, as it has a greater proportion of gastric juice to act upon the food, although that gastric juice is weakened by the liquid taken on the stomach.

"Heat," says Dr. Ferguson, "is certainly a secondary agent of digestion in skilful hands; but it would become a primary one, supposing a dog thrust into a cold damp kennel or cold stable after work. In the latter state, when fed, digestion would go on slowly and imperfectly, as the efforts of the heart would be directed first to the restoration of the general warmth; thus time would be lost, and nutriment denied to the exhausted dog, independent of other bad consequences; but give him external warmth, the process of digestion goes on instantly, and with infinite comfort to the animal."

In the second position which I have taken respecting "good wind," it must be evident that the continued progress of the food in its healthy and most desirable manner, is dependent on its regular and natural course in the stomach, or first position; it is also necessary that the food should be of a good and nutritious quality, congenial to the nature of the animal, and if of different sorts at the same time, that one should not impede the process of the other in the stomach, so that the circulation may not become oppressed by breaking in upon the balance of the circulating fluids, as is the case by mixing liquids with animal jelly, in order that the dog's strength may be supported in the best possible manner while running his course. This leads me to the third position of good wind, exhaustion.

The organs of respiration may be in perfect good tune by the regular process of the food throughout the first and second position, equally the same as if fed on a greater or less degree of nutritious matter, one sort of food supporting the strength of the dog during his utmost exertion in a greater degree than the other. Thus if two dogs are put down to run, the organs of respiration in each being in the same state of perfection, and one dog of more muscular strength than the other, from having had a proper quantity of more nutritious food, while the food of the other was of a weaker nature, and consequently he would be of less muscular strength, which will hereafter appear to be the case, notwithstanding they may each have had exercise corresponding to their food; the weaker dog would of course become exhausted the first, and that exhaustion will cause violent and distressing action of the organs of respiration sooner than in the dog whose muscular strength is better supported by solid food, and consequently the strongest dog endures exertion the greatest length of time before he is distressed for wind; it is not his wind, in this case, being in a bad state, which causes his distress and exhaustion; it is his bodily weakness which causes exhaustion, and that distresses him for wind. If two dogs are of equal bodily or muscular strength, having been previously fed and exercised alike, but one of them in worse wind than the other, which may be caused in various ways; for instance, having, a short time before running, got to some food and filled himself, or partly so, the case is reversed; as then bad wind is the first cause of exhaustion; while in the other, exhaustion is first produced by bodily weakness, followed, of course, by distress of wind. It therefore follows, that good muscular strength is equally essential to good wind, as the organs of respiration not being obstructed by indigestion, or the stomach being overloaded, and the system being oppressed by improper food are: and this is equally the case with a delicate feeding dog, or giving a free eating dog such food as is weak, and in such quantities as is not congenial to his nature.[1]

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[1] I apprehend that this distinction upon distress for wind preceding and causing bodily exhaustion, or bodily exhaustion preceding and causing distress for wind, has been overlooked by those coursers who give a decided preference to gelatinous and farinaceous substances, without any portion of flesh food, in their daily meals; thereby reducing a robust free feeding dog, *in degree*, towards the state of a weak and delicate feeding dog, thus thwarting nature, and losing both strength and wind. The theory of this is supported and confirmed by practice, as far as my experience extends, and I have witnessed the different effects on very many occasions.

It is evident, that many who feed upon gelatine and farina are aware of flesh being their more natural food, and giving greater strength, by the very common practice of giving occasionally, as the term generally used is, *a belly full of raw flesh*, which cannot be productive of benefit towards fine condition for running; for while the nutriment and stimulus afforded by so much flesh are in operation, their habit is overloaded; the stomach oppressed by weight it is not accustomed to; and when upon less nutritious food the succeeding days, they feel the loss of that nutriment in a greater degree than if they had not previously received so much of it. A moderate portion in their daily meals is far preferable.

They probably also overlook, or are not aware of the very great portion of nutriment which is lost by evaporation in cooking, and therefore consider jellies to possess much more nutriment, or that of a better quality, than they

Good wind and muscular strength are, however, effected by the mode of feeding, after, as well as before running; and which, when they have to run again after one or two intervening days, and especially the following day, is highly necessary to be attended to, or even for their general health, when they are not expected to run again for some time.

In order to have them sufficiently empty when they run, so that their organs of respiration may not be obstructed, it is the opinion of experienced coursers that they should not have their principal meal much, if any, less than twenty-four hours before running; they are after running frequently four or six hours longer before they get to their kennel to be fed; consequently, without being distressed by running, much more so if they have had one or more distressing courses, their stomachs are exhausted; they are also frequently chilly and cold when taken to their kennel, jaded and dispirited; the energies of their stomachs require stimulating and restoring before being able to perform the proper functions for a hearty meal in the regular and natural course; and if you give them a full meal while in that state of chillness of the frame and debility of the stomach, the efforts of the heart are first directed to the restoration of the general warmth, and the debilitated stomach, when most in need of assistance, is deprived of its most essential aid, and digestion goes on very slowly for a time; meanwhile, the dog is uncomfortable and restless, which causes debility, and its general attendant, inflammation.

To prove this, it is only necessary to refer to any one when returning from a hard day's hunting, or other long fasting and great exertion; if you sit down immediately and eat a hearty meal, and especially of cold meat, either of which the appetite will generally induce you to do, you soon afterwards feel uncomfortable, and for some time, and especially in a cold room; but if

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really do, and thereby err in supposing that they are giving much nutriment in small weight or compass; they are thus training for wind and not for strength, which is an erroneous fancy, as they ought to train equally for both.

you take a basin of warm broth or soup, or tea, half an hour or an hour before your meal, and get into a warm bed for awhile, you feel greatly restored, and enjoy your dinner, and feel comfortable afterwards. A plate of soup in that way not only does you much more good itself than the same quantity immediately before eating your dinner, but your dinner also does you more good, and strengthens you more, than if one be taken immediately after the other.

It is the same with a greyhound. As soon after coming home from coursing as it can be obtained, he should have a little warm broth, which, by the time you have wiped him quite dry and clean, and done the necessary things about him, will have stimulated and restored his stomach, and assisted in restoring his general warmth; the liquid will soon pass off the stomach, and he will be ready for his meal, which, under these circumstances, should be warm food of whatever nature; he should have a soft warm bed, and be in a dry, warm kennel. There is also another advantage, and a very important one, if he has to run again the following day, which will not admit of a full meal, for want of time to have him sufficiently empty, and his organs of respiration in proper tune, the stomach, by being so restored to its energy, will be in that healthy and vigorous state that will admit of your giving him more solid and strengthening food than if you give him his meal before the energies of the stomach are restored; flesh, in moderate quantity, would be digested in this case, as soon, or nearly so, as in the other case farinaceous matter or other food would be, of easier general digestion than flesh; his strength would thereby be better supported when running his courses the following day, and he would consequently not be so soon distressed for wind.[1]

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[1] Under these circumstances, mutton would be preferable to beef or horseflesh, as being sooner digested, and yet nutritious. A slice of a leg of mutton, of about a pound weight, half broiled, and make up about three parts of a good meal with farinaceous food; pudding, bread, or oat cake toasted, or biscuits soaked in good broth, but no more broth than the bread will absorb. The mutton should not be younger than a three-shear sheep, well fed, and if killed a few weeks previously, it would be all the better for easy digestion, without losing any portion of its nutriment.

In judging of what kind or quality of food, as well as the quantity best to be given to a dog to have him in the finest possible state of condition to course, it will, as in other cases, be necessary to take nature, as well as experience, for our guide. "Flesh and bone," says Dr. Ferguson, "is the natural food of dogs; else why has the Creator furnished the dog with a jaw of so much power, and teeth so admirably formed for crushing hard material? The masseter muscle in the dog is peculiarly large and powerful, and by its contraction, with the assistance of the teeth, is capable of crushing to powder the hardest substances of bone." The lion and tiger, as well as other beasts of prey, are similarly furnished with powers of mastication; while the horse may, for one, be contrasted with them; the masseter muscle with him is not peculiarly powerful, and his hindmost teeth, commonly called grinders, are rough at the ends where those of the upper and lower jaw meet, and admirably calculated for grinding their corn; while the fore or front teeth of both jaws meet exactly, and are thus equally calculated for biting the grass from the ground, or eating their hay, which is not the case with the dog.

The natural propensity of the dog to eat bone, portions of which go uncrushed into his stomach, and are there generally digested, (yet not always, as pieces are known to come whole from them,) it would thereby appear contrary to nature to give him food easy of digestion to support his strength under the utmost exertion, especially if that easily digested food is materially less nutritious, both in quantity and in quality of nutriment.

With respect to the quantity of food proper to be given to a dog in a day, or how often in a day to feed him, the horse may be again contrasted with him in the capacity of his stomach; that of the horse, in proportion to his size, is not so great as in man, nor so much space in the stomach; the horse, when at rest, with food before him, eats slowly, and continues eating perhaps eighteen hours out of twenty-four. Men, who work hard, require two or three full meals in a day; while a greyhound, not a third part of the weight of a man, has a much greater capacity of stomach, and will eat more of either weight or measure at one meal; after which, if left to himself, he goes to rest, and is indifferent about eating more that day.

If you train a horse for racing, you give him, at stated times in a day, as much corn as he will freely eat, with a moderate portion of hay, giving him time before running to have his stomach and intestines sufficiently clear from it, as offering no obstruction, by distention of the stomach, to the organs of respiration; it is the same in principle with a dog; but by the greater capacity of the latter's stomach, if he were to have his full meal entirely, or nearly so, of flesh, it would require a longer time to have the circulating fluids in a proper state for good wind, than would be consistent with his rest being undisturbed by the craving and exhausted state of his stomach. A certain medium is therefore absolutely necessary; a happy mixture of solid food with that of easier digestion, flesh and farinaceous substances; a less proportion of flesh to a dog than of corn to a horse, and a greater proportion of farinaceous substances to a dog than of hay for a horse. The comparative organization of the horse, dog and man, as respects their feeding, will be more fully considered at the proper stage, in conjunction with that of feeding the greyhound two half meals, or one full meal in a day.

Intimately connected with the question of which is the best kind of food to give greyhounds in training, is that of the effect exercise has in giving them great muscular strength. "Exercise," says Dr. Ferguson, "by the frequent contraction and relaxation of the muscles, increases their bulk, as may be seen in the arm of the blacksmith, or the prize-fighter in sparring practice; flesh is at all times muscle, and by exertion and irritation of its fibres it not only increases its bulk, but hardens, and if I may use the term, compresses it into a state of active and powerful capability." We have before seen, under the same authority, that "the bones may be considered merely as levers, acted upon and moved in various directions by the contraction and relaxation of the muscles which are inserted into them; and as the fleshy part of the muscle is the only contracting and relaxing part, it is quite manifest, the more bulk you produce, the greater momentum or propelling *power* will be given to the animal.[1] The tendonous part of the muscle has nothing to do with action, possessing no irritability or power of contraction."

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[1] I cannot here refrain from giving an anecdote of an old and experienced courser, who had witnessed the beautiful style of running of a brace of

The subject here resolves itself into a question of what kinds of food for a dog are most conducive to the development of muscular power. And here I must bring again my old favourite, the horse, as an auxiliary. As some fanciful coursers, however, are so partial to gelatinous substances, with a superabundance of severe exercise for their greyhounds, over their natural food of flesh and bone, and corresponding exercise, I cannot but marvel, that long ere now, some ingenious improver of the admired works of nature,

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greyhounds that had been fed on flesh and farina for several days previously, and their condition appearing so good, so little distressed after their courses, which were severe, that they excited the admiration of all the sportsmen in the field, and many remarks were made on the subject of their condition. The owner of them, who was a butcher, by way of throwing out a *bait* to excite their curiosity, dryly remarked, " that they were *not quite* up to the mark; they wanted sixteen pence laying out upon them for one ounce of stuff." " I wonder what that ounce of stuff is," said the old courser, and set a friend to get the knowledge of it from the owner of the dogs, but without success, as the butcher was only *stuffing* his hearers' ears.

A gentleman purchased a brace of greyhounds from a breeder of them, who was celebrated as an excellent trainer, and after paying his money, " Now, Sir," said he, " you would much oblige me if you would inform me how you train your greyhounds." The seller of them considered, that though he had sold the dogs, he had not included in the bargain his knowledge of the best mode of training them; yet with the cash in his casket he could not handsomely refuse the request altogether; he therefore stated what food he gave, and the general routine of his kennel management; " but," said he, " if you want to win a Cup, you must mind what I am going to tell you; it is a trifling matter, but which you must on no account omit." With mouth wide open, the gentleman stood in anxious expectation of being on the eve of arriving at the *grand secret*, while the other proceeded, with difficulty controling his own risible faculties. " When I am going to run for a Cup, I always put some gunpowder in a bit of paper, screw it up, and put it in the pocket most handy to be come at in the critical moment; then, taking care to let no one see me, I stick it under *the dog's tail*, so that when a hare starts, I apply my cigar to the gunpowder, and off he goes like a bullet. The Snowball blood, or the Skyrocket combustibles will not have the least chance with you, if you adopt that plan."

has not invented and obtained a royal patent, for a method of making jelly from corn to feed a horse in training, instead of giving him good dry old oats and beans, and lusciously sweet hay, and a machine to compress the muscles into their required powerful state.

If you want to fatten a horse for sale, you give him green or wet food, grass, and boiled, or other moist corn; if you want him for work, you give him dry food; in a similar way you fatten a dog or a man; milk, broths, gelatinous and farinaceous substances will do it sooner than flesh, or more solid and dry food; the latter will possibly produce less flesh on the body, but of a firmer texture; and the question is, if a question it can be deemed, which kind of flesh on the body, fat or lean, is compressed with the least exercise to the muscular fibre, so much required in a greyhound, to give him the greatest propelling power, and to support his strength, so that he shall bear the longest exertion before he is exhausted, and consequently longer before he is distressed for wind? There are different degrees of condition; good, bad, and indifferent; and I am aware, that many greyhounds run, what is called *well*, under a regimen of gelatine and farina, their natural courage being such as induces them to run till they drop, and which, with tolerable strength, will enable them to do so without flesh; but that is no proof that the same dogs would not have *run better with it;* you must give an extra quantity and severity of exercise to compress the flesh into a state of active and powerful capability, by which you deprive him of the âcme of his speed as well as fire.

You may gain fire by keeping the dog under restraint; but unless you give him sufficiently severe exercise for his wind and strength, that fire will only be like a flash in the pan; you in fact lose fire in a two-fold manner; flesh being more nutritious and stimulating, and more congenial to his nature, imparts more fire to his temperament than weaker or less natural food; and by giving flesh in proper proportion, you do not lose the fire imparted by restraint; for with flesh he does not require such severity of exercise to compress the fibres to a state of active and powerful capability as will deprive him of his fire. Flesh, however, possessing much nutriment and stimulus, if given too plentifully would require very strong exercise to prevent the blood being too than the greyhound does that excellent remark of Doctor Ferguson's apply, that "too much exertion, long persisted in, appears to destroy the vigour of the animal by exhausting his powers. The mind of man, overstretched by study, is rendered weak and feeble; it is the same with the body; great exhaustion is attended by great debility; the measure of debility is in exact proportion to the measure of exhaustion."

Considering this essential variety, both in food and exercise, as absolutely necessary to the health, strength, and vigour of the animal in question, coupling with it my own experience and observation, and confirmed as they are by the philosophical explanations furnished me by several medical practitioners of eminence, I am thoroughly convinced, that with a greyhound in good health and good heart, his previous food being such, that a change to high stimulating food will not be too great or sudden a transition; I am confident that you may get him to the pinnacle of condition, or, if I may use the term, that you may *spring him up to the tip-top of the mark*, in less than a week's time.

I do not only mean that you may have him in as good condition as by a longer time of strong training; I mean to say that you may have him in *much better* condition in that time than in a longer. You may have his health, strength, vigour, courage, fire, and wind, and the acme of his speed, one and all, in that perfection as to "produce the idea that the excellencies of the animal could be carried no further;" which you cannot have, one and all at the same time, in perfection, to continue him in that high stimulating state for many weeks together, as he will be sure to become "dull, stale, flat, and unprofitable."[1]

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[1] Since writing the above, I find from an article in the Sporting Magazine, June, 1820, signed "an Essex Man," that I am not singular in my notion of the principle of getting greyhounds up in a short time; he alludes to a Mr. Lascelles talking of training a greyhound sufficiently in a fortnight; but thinks by that he "undoubtedly means only for common occasions," and witnesses the far greater number of farmers' greyhounds on whom no

Before proceeding to that system of feeding which is most conducive to this fine state of condition, it may be as well to offer some remarks on purifying their blood and habit by physic; for, to have them in the best state of health, strength, and wind, it cannot be doubted that a purification of their system is absolutely necessary for the food you give them having its best and greatest effect towards the object you desire.

It is the practice with many coursers to give, previous to training for the season, two or three strong doses of purgatives. How far such strong doses may be necessary, when a dog is diseased and ill, I will not pretend to say; but I very much doubt the utility of them to a healthy dog, though his habit may be a little gross or foul. I have frequently observed greyhounds, after even one dose of strong mineral purgatives, to be a week or ten days before they recover their wonted liveliness, but which they recover in a short time after an emetic; the latter would appear to be the dog's instinctive medicine, and consequently most congenial to his nature. If a dog in health is in a grass field, you do not see him eat grass, which he does if unwell, and which makes him vomit. But greyhounds that I know, which are never prepared by purgatives before coursing, run as well throughout the season, and each successive season, by having only emetics, as any kennel of greyhounds that are prepared by purgatives.

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such idea was ever entertained, as bestowing any other education or training than following their master from their puppyhood, in his daily walks or rides. "Yet," he adds, "I have coursed a March hare with such three to five miles at a burst, and killed." I have not met with the works of Mr. Lascelles, but I should say, that by sufficiently training in a fortnight, he "undoubtedly" means to have them in the best possible state of condition. The farmers' greyhounds he alludes to are probably, by the education and training he speaks of, in a proper state to put into what he calls regular training, a week of which will better enable him to kill a March hare than being in that regular training for a much longer time. As a confirmation of Mr. Lascelles' meaning more than "for common occasions," he recommends confining this forcing of the dog's powers to only three times during the season, as being unsafe (I suppose he means without danger of injuring his constitution) to do so more frequently.

Salt acts as an emetic on the stomach of a dog; I recommended a friend, at the commencement of a coursing season, to try it upon his greyhounds, which he did, and refrained from purgatives altogether; two of them were unwell, and had been some time; the others in good health; two or three tea-spoonfuls of common salt in a pat of butter were administered to each dog; then the dogs were led about till they vomited; those in good health threw up abundance of slime, but those unwell threw up the most filthy matter, of all colours, and in great quantities: they all recovered their health very soon afterwards. Now these dogs were fed all the season upon a good portion of flesh, which is considered generally to render a dog as foul in his habit as any food; but their owner positively says, that he never had his greyhounds in such prime condition before in his life as they were that season; nor ever knew them so full of courage, and to take the fences in so undaunted a manner, and recover their wind after a severe course in a very short time. This emetic should be administered a few times in the summer, by which, and clearing the stomach of slime, and occasional drenches of good sweet whey from the cheese tub, as a diuretic, you supersede the necessity of purgatives, as you prevent the impurities entering their blood, rendering its purification less necessary at the commencement of the season; the only times when the purgatives can be of more real service than the emetic, are when a dog is in tolerable health, when he is observed to be constipated; when a mild vegetable purging ball may be given, to prevent any accumulation of indurated fœces; or a mild dose or two may be given a few days after the emetic, if a dog comes up from quarters, especially from the "butcherie," in a very fat and foul state. The emetic is as good as any alterative medicine at any time; and during the season, when your dogs have been on high feeding for a length of time, if you have a week or two of interval between coursing meetings, it may be given without inconvenience, as he will soon recover his wonted strength and liveliness after it, and be all the better for the temporary relaxation.

Now, according to what is before stated, that a short time is all in all sufficient, under the circumstances mentioned, for getting them in the acme of condition, so is it necessary that they should be in a fit state to be so sprung up to the mark; that they should be tolerably fresh, that is, not lean and poor; and that the flesh on their bodies should be of a firm texture; for without muscular support, if I may use the term, they cannot maintain any length of course without being distressed for wind; to have good wind, you merely want good health, no obstruction to the action of the respiratory organs by the stomach being distended with food; their blood and internal parts cleared of any superabundance of fatty matter; the former to admit free action to the lungs by no impediment to the circulation or congestion of it to load them; the latter to give greater expansion to the chest, and allow more room for the lungs to act. These you may have without *strong* exercise; and with plenty of *gentle* exercise you may have the muscles of the limbs and outward body tolerably well compressed to give bodily strength; but to have good wind for a course, you require a proper portion of *strong* exercise, to *exercise* the muscles of the respiratory organs, which are very numerous and complicated, as they require strengthening by exercise equally with the muscles of the limbs, and by a proper quantity of strong exercise you compress the muscular fibre of both into a state of powerful capability, and give both bodily strength and good wind.

Mr. Hassall, as stated in p. 229, says, "that a robust dog cannot run *light*, and the feeble and delicate cannot run *heavy*." In the first he is unquestionably right, for the more robust he is, the more support his strength and weight require; but that should be firm muscle, not overloaded with fatty flesh. I have, however, yet to learn, in the second, that the delicate can be made *too* heavy with *firm muscular flesh*, for without it they will be *feeble indeed;* you cannot give a dog a greater propelling power, or more speed, than his natural frame will admit of; but you may very materially reduce his speed by insufficient or improper nutriment on the one hand, or you may make the best of his natural powers on the other, by giving as much nourishing food and good exercise as his constitution will bear; fine muscular development assists both speed and wind, and consequently a continuation of his good speed. This may, and to do it to the best advantage, *must* be done by a system of giving what I denominate *dry food,* that is, not slops, broths, and jellies, with lighter food than flesh, such as cowheel, or flesh with liquid broths at the same time, or soon after; for though there may be some bread in it, if the broth goes on the stomach in a liquid state along with the solid food, it will be detrimental to the firmness of the dog's own flesh, or will require more strong exercise than is otherwise necessary to prevent an internal accumulation of fatty matter, to which such food conduces in a greater degree than dry food.

A description of food very proper for greyhounds in their preparation previous to pushing them up to the top of the mark, is oatmeal balls or dumplings. I know one courser who makes it his *principal* food for them all the year round, even when preparing for a coursing meeting, and his dogs run well; also a few others, who inform me, that their dogs run as well upon those dumplings as any food they have found out to give them, notwithstanding they have tried several sorts; I have had very satisfactory proof of it several seasons, and as it corresponds with the opinions favoured to me by my medical friends, I have no hesitation in recommending it to my readers: good wholesome horseflesh moderately boiled, then pounded and mixed with oatmeal, some refuse fat or dripping to make the oatmeal adhere together in a ball; a quarter to half a pound of flesh for one dog, and as much oatmeal as will make a dumpling sufficiently large to be a full meal for him. Some add a little salt, which, although when taken in quantity, acts upon them both as an emetic and a purge, in this food a small quantity will have no tendency that way, but on the contrary, by its adding flavour to the food, will cause the dog to eat with a better appetite, and consequently more plentifully of it; but if so much is given as has a tendency to make him thirsty, it will do him more harm than good.

The liver of an ox or cow, the gally and gristly part cut away, then boiled two or three hours, and hung up to dry four or five days, or a week, and mixed with the meal, is better than horseflesh, as by drying it you get rid of the watery and foul parts of it; and dogs not being thirsty after eating a full meal of *it alone*, shows that its digestion goes on well, and it is moreover nutritious. Its possessing so much sameness of nutriment and digestibility, to feed alone of it, cannot be conducive to the economy of the animal system; yet as a portion of his food it is a very proper substance.

If you have not any refuse fat, a little water will do, but in that case there ought to be rather more flesh in the dumpling. A delicate feeder will be as well with rather a greater proportion of flesh; for if his stomach has less powers of digestion than a voracious feeder, it should be remembered, that, according to Magendie, the smaller the pieces of flesh, the sooner they are digested; and flesh does not lose nutriment in pounding as it does in cooking. If a few boiled vegetables were mixed with the dumpling, it would increase the nutriment as well as increase its variety, and prevent its being too heating, which meal itself is, and causes thirst, besides other disadvantages; they will also induce the dogs to eat more of it, and it is desirable that they should have a full meal, and be shut up in a warm kennel and have a soft bed, without liquids for a few hours, after which water may be set before them to lap.

With this food, and occasional variations, even without much strong exercise, or only running about the yard or homestead the fore part of the day, a greyhound is always ready, without any previous notice for any private coursing you may have occasion to take him to; he is also always ready to be put into strong training, without too sudden a transition to strong food, to run your most important matches. A few bones should be given them most days after eating their dumplings: bones, as before stated, being as necessary to a dog as sand and gravel to a fowl; and their instinctive desire to eat them is such, that with flesh or other food before them till they will eat no more, if you offer them a bone, they take it greedily. It may be termed the dog's dessert.

Now although, as will be seen hereafter, in preparing for a coursing meeting, a decided preference is given to good beef or mutton over horseflesh, and also that fat of all descriptions should be avoided, even that on the broth with which you mix your pudding, yet on this occasion sound wholesome horseflesh is sufficient, and so little being given, the small quantity of fat prescribed necessary to mix the meal, is nowise objectionable. One day in a week, or perhaps three days in a fortnight, they should have a change of food;[1] such variety appearing, by Magendie's experiments to be quite essential or absolutely necessary to perfect health and strength; broth, for instance, mixed with wheaten flour, with bread and a small quantity of raw flesh, or any other wholesome food, made into a pudding. This system of feeding is as conducive to the object you aim at, as any food that can be given, when not immediately wanted for the field; is perhaps as little expensive as any, and is attended with less trouble than the manner pursued by many coursers; the feeder, in half an hour or an hour, will make as many dumplings as will serve four or five brace of greyhounds for several days, which may be thrown on the "shelf," though not lie so long as in chancery; and the other days a few minutes each day will serve for the purpose of feeding.

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[1] Fasting a generally well fed dog, an odd day, now and then, is beneficial to him, and assists nature, always at work for that purpose, in ridding itself

I am perfectly satisfied that one meal, and that a full one, in a day for a dog when in training, is much better than two half meals; it is much more in accordance with the capacity of the stomach with which nature has provided him, and he rests better in his kennel without craving for more food; his being warm and resting well in the kennel are of more importance to his strength and vigour than many coursers imagine. For this purpose a good warm soft bed is very essential, the straw frequently removed, and

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of impurities in the blood and system, which may be generated by a long course of stimulating food, without physic. So is it beneficial to a dog when not wanted, or not likely to be for some time, for work, to be some days together in a medium way, between fasting and full fed; that is, to have small quantities at a time, many times in the day, of any or all sorts of food, for several successive days, with gentle exercise, as it allows nature more time gradually to rid itself of those impurities.

Poverty is a famous physician to a man accustomed for a long time to live in luxury and ease; to give nature a fillip in the opposite way, is a favourite maxim with some; but Dr. Goodwin, of Wirksworth, used to say, "If you must give nature a fillip to advantage, you should live on water gruel for a week." My own opinion, both from theory and experience of my own feelings, is, that a fillip *either way* may be beneficial, according to the previous high or low living, for a length of time, and will renovate the system; one, by giving increased energy, and the other by ridding the system of impurities, and giving ease to the organs and faculties previously stimulated to exertion for a long time.

fresh clean straw substituted in its stead; some say every day; others, two or three times a week; this, however, in some measure, depends on whether the dog is chained to his bed, or has the liberty of removing to another part of the kennel to empty himself. Cleanliness is nevertheless indispensable, and the kennel should never be omitted being well cleaned out every day, and very frequently in the week, or every day well swilled and washed out with water, to sweeten it from the stench there is sure to be every morning when dogs have lain all night in it.

With regard to exercise in this stage of their preparation, it is absolutely necessary to produce fine muscular development, by irritating the muscular fibres; but if you give them much strong exercise at this time, you defeat the principal object; you lose the acme of their speed, and make no reserve of their "powers from spending till time of necessity."[1] They should be taken out the fore part of every day (Sundays excepted) with a man on horseback, he going a gentle trot, say six or seven miles an hour, for a few miles on the road and back again; but instead of being loose and at liberty, they would be much better coupled together, two and two; then where you meet with a proper field to loose them in, to gallop and scummer about, as Markham terms it, their liberty will be a greater novelty than if they had been loose on the road; they will gallop with more eagerness, the whole animal fibre will be more on the stretch, and their exercise all together be of a better quality. Four days in the week will be enough for this sort of exercise; or one of those four, a gallop of one or two miles with horses, or even one course for each brace of dogs, will tend to promote their future strength; but an interval of a day now and then from galloping, will induce them to gallop more eagerly those days that they are loosed for that purpose; it is the pace which kills; and that pace requires providing for by inducing a great pace in exercise, though the distance may be shorter.

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[1] Arrian, speaking on exercise, says, p. 100, "Slip them in pairs, a brace at a time, so that by contending and playing with each other, they may enjoy their pleasure, and take their exercise together. But on no account let many loose at once, as they sometimes do much mischief by falling on each other. Never let such as are spiteful to each other have their liberty at one and the same time, lest they injure one another. For there are dogs as well as men with mutual antipathies, and others again with mutual attachments. Those of the same sex are particularly inimical to each other, dogs to dogs, and bitches to bitches; and this generally from spiteful jealousy. These are matters not to be made light of."

There should, however, be a distinction made between old dogs and young ones; the former, as is seen by race horses as well as greyhounds, sooner recover their wind than young ones, neither is there so much fattiness between the muscular fibres to get rid of as in the young ones, and the old ones, moreover, require more rest than the young ones. They should, nevertheless, have as near their regular proportion of galloping exercise as you can induce them to take, so that to reduce their whole quantum of exercise must be by lessening their quantity of gentle, or trotting exercise.

When you return them to the kennel, they should have their feet well washed out, and their bodies well cleaned; rub them well over with a wisp of hay or straw, then brush them well over, and get all the scurf and filth out of their coats, and afterwards wipe them well all over with a cloth. I will present you, in a few pages, with Arrian's instructions *how to dispose of your hands during the operation.*

This cleaning them, independent of the healthiness from their being divested of filth, is otherwise beneficial to them, and in the rubbing part, the old ones should have their full share; it is a sort of artificial exercise, creating a quicker circulation of the blood, and by irritating the muscular fibres, assists in rendering their flesh more firm, and gives the muscle more powerful capability; it also increases their general warmth, by which the digestion of their food will go on more regularly and in its natural course, and render the animal more comfortable, by which he will rest so much the better.

After they are cleaned give them a full meal, and when they have been at rest a few hours, a little water to lap "assists the chymification of the food and its passage into the duodenum." By a full meal I only mean to apply it to those which are free good feeders, and not to those that eat so voraciously as to make their system too full of fatty matter; such must, of course, be gradually stinted down to no more than what a common feeding dog will eat; even a commonly free feeding dog, not a voracious one, should be confined to what he will eat with a good appetite, not to satiety. They may, a few hours afterwards, be taken out for a little gentle exercise; when brought back to the kennel, it may be as good a time as any to throw a few bones to them before shutting them up for the night; but they should be brushed over and wiped down, and made clean, warm, and comfortable.

Some coursers will dispense with this second exercising, nor do I think it very important, but they will rest full as well during the night for it, which, with fresh air, and their kennel sweetened by the door being open during the time they are out, is its principal benefit; and the bones given will assist that rest, by keeping them from craving for more food, as well as carry on, or eke out for a longer time, the progressive support to the frame.

It has fallen to my lot to meet with but few persons who consider bones of any particular use to them, except as making up their meal when short of other food; few coursers make a *point* of giving them bone; they get it, as it were, by chance; but I am quite satisfied, that a proper proportion of it, *most days*, is quite essential to their being in perfect health and strength.

Some coursers may give a short-lived smile at the idea of introducing vegetables to the trough of a greyhound in training; but I know those who make a point of giving them, and particularly the last few days before coursing them, whose greyhounds run as well as any kennel of greyhounds that I know, both in speed and stoutness.

Dogs live and do well on vegetable and animal substances, equally well, in fact, just the same as the human species, and everything seems to indicate a similarity of treatment for one as for the other; the medical, anatomical, and philosophical experimentalists feed and kill dogs to ascertain results for instruction, as to the proper treatment for the benefit of the human species, and the phenomena presented are in most cases exactly the same as when human bodies undergo a *post-mortem* examination.

It was, according to Cicero, as before stated, "that mankind, by availing themselves of the adapted powers of the dog, subjugated such wild animals as were originally designed by a bountiful Creator for the sustenance and recreation of man." It was not till man had availed himself of the aid of the dog, the most faithful of all faithful beings, that he accomplished his dominion over the beasts of the field. Somerville says,

> "The brute creation are man's property,
> Subservient to his will, and for him made."

And Byron,

> "The poor dog, in life the firmest friend,
> The first to welcome, foremost to defend;
> Whose honest heart is still his master's own,
> Who labours, fights, lives, breathes for him alone."

Thus we have every manifestation that the dog was ordained by the Creator to be the servant and companion of man, his friend and defender, with a fineness of hearing, and a watchfulness against all danger, peculiar to him alone, for the safe protection of his master, or his master's property; to eat the same food, and is ruled by the same laws of nature. In short, everything within our knowledge indicates the dog's peculiar servitude to man; our own personal observation and experience of him; the earliest records of history; his unwearied attachment to men in general, to his master in particular; his watchfulness and instinctive protection of his master's property against intruders and depredators in his master's absence; his alacrity and energy in obeying his master's orders, and instinctive sagacity in understanding them whether denoted by word, deed, or gesture; from all which, we may draw a rational conclusion of the beautiful adaptation of his organization of stomach and intestines for his own support, is in unison with that of man himself; the stomach of man being adapted for feeding more than once in a day, that of the dog for only once a day, if necessary, or occasionally eating more frequently of smaller quantities.

In the more wild and uncultivated state of society, in olden times in particular, and not dissimilar in more modern times, the dog is watching and guarding his master's property in his absence, or while his master is eating his several meals in the day; a portion is left for the dog, and amongst other food, the master leaves the bone from what flesh he had been eating; when the day's duty is over, the dog has his meal, and his instinctive propensity to eat bone corresponds with the organization of the stomach, and the regular and gradual support of the system, requiring a greater length of time for digestion than his other food, to eke out that gradual support till the return of his time for feeding. He is then, with a most capacious stomach, distended with food, obstructing respiration if at work, peculiarly unfitted for labour, requires rest, but does not lose his watchfulness, and is calculated by his extreme fineness of hearing to give alarm in the night on the approach of danger.

Thus nature has provided the dog with an organization peculiarly adapted for the use and benefit of man, and to be in constant attendance to his duties; his food consisting of different degrees of digestibility, bone, flesh, bread, and vegetables; a system and nature of food desirable to man, who eats two or three times in twenty-four hours, but absolutely necessary to the dog, who has to be contented with only one meal in that space of time, the nutriment coming gradually into the system producing a succession of support, and flesh on his body more firm, and giving greater power than the more fatty flesh which is formed on the body when the whole meal's nutriment comes nearly altogether into the system.

If there is any one particular food, or manner of feeding, can be supposed to be more intended by Providence for the dog than an other, it must be that he was intended to eat what his master leaves; and that he eats his full meal when he has finished his day's work, during which time he is subject to be required for great exertion, but would be quite unfit for such exertion were he fed during the day as often and as full as his master feeds, which is in perfect unison with the comparative size or capaciousness of the stomach in one, and that of the other. The feeding of a kennel of greyhounds, whether the inmates are numerous or few, should be assimilated as nearly as possible to the manner which is best for one dog to be fed. Suppose a dog would eat three pounds' weight of food, without glutting or satiating himself, which is about the calculation, though full enough when in training, for a healthy, strong, good sized greyhound dog; if you give him one half of it flesh, including a proportion of bone, and the other half bread and vegetables, equal portions; broil a pound and a half of *lean* flesh, boil some potatoes, peel and break them down, and mix them with the gravy, cut the bread and flesh into moderate sized pieces, and put them altogether, and the dog will have a good, substantial, and what is more, a natural meal. I have, however, heard those would-be-knowing feeders of dogs, say they think it unnecessary, and too much trouble, to peel the potatoes, considering that if the peel does no good it can do no harm; this is contrary to all reason; they may with equal reason say, that it is an unnecessary trouble to wash the dirt from the potatoes; for on the contrary to what they say, if it does no good, I say it *must* do harm. Magendie has proved, and so has Sir Astley Cooper and others, that the peel passes off entirely undigested, being impervious to the gastric juice; it occupies space, and adds weight to the food, thereby adding an additional burden to the stomach, and distending it, makes the dog more uncomfortable, and moreover employs a portion of the gastric juice for no purpose, which would otherwise be acting on the digestible food. Trouble, or not trouble, it must be done, if the dog is to be fed to the best advantage.

It does not, therefore, follow, that vegetables are a primary consideration in the food of a dog; they are nevertheless useful auxiliaries, and especially when you want him to be in the best health and strength. Bone is manifestly a food peculiar to the dog, as he will eat it when he will eat nothing else; flesh, as attached to bone, comes next, and is his most strengthening sustenance; cowheel, or sheep's trotters may come next in order; after them, farinaceous matter, which is in fact vegetable substance, and then vegetables themselves.

"The stomach of an animal," says Dr. Teulon, "digests animal food, as flesh, easier than vegetable substances, inasmuch as flesh has undergone the process of digestion on the stomach of an animal previously; whereas vegetable food has not undergone that change or animalization which renders it congenial.—Thus flesh, by its greater comparative stimulant and easiness of digestion, gives greater and more durable strength to the animal to whom it is a natural food, than vegetable substances; it excites more, and produces a greater degree of fever in the system than vegetable diet, and thus gives greater courage and fire, approximating towards savageness to the dog; there can, therefore, be no question that it is the best food for a dog in training, as it is the most natural. It also appeases the appetite for a longer time, so that the dog is not so soon disturbed in his rest by craving more food. As regards flesh, or any other food, what may be highly proper, and indeed absolutely necessary for an animal under certain circumstances, is equally improper and injurious under others; but in preparing the greyhound for the course, you want to combine great strength, fire, and fine wind; and flesh, from its nutritive as well as its stimulating qualities, is most likely to produce these requisites."

This idea of Dr. Teulon's is supported by Magendie, who says, p. 251, "animal substances are generally more easily and completely changed than vegetable substances. It frequently happens that these last traverse the whole intestinal canal without changing their apparent properties. I have frequently seen in the rectum, and in the small intestine, the vegetables which are used in soup, spinage, sorrel, &c., which had preserved the most part of their properties; their colour alone appeared sensibly changed by the contact of bile."

It therefore appears, that the whole nutriment contained in vegetable substances is not thoroughly converted into aliment on the stomach of an animal to whom flesh is a natural food; but whether it is so or not in the stomachs of those animals whose natural food is entirely vegetable substances, does not appear;[1]

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[1] Horses, which live on vegetable food, have it so much longer under process of digestion than dogs, which may cause its properties to be more com-

those animals that eat flesh, only derive benefit from a portion of the vegetable nutriment, while from animal food, they receive the whole nutriment into the system, which accounts for the additional strength afforded by animal more than by vegetable food. Cowheel is a favourite diet for greyhounds with many coursers, and to a certain degree, deservedly so. It contains a good portion of nutriment, is light, and easier of digestion than flesh, and consequently sooner gets into the blood, and is thrown over the animal system in its support; but it does not contain near so much nutriment as flesh, a great portion being lost by evaporation in the long time required for cooking to render it easy of digestion; and, as Dr. Ferguson justly observes, "you lose quality as well as quantity;" there is great difference in the quality of nutriment; clean nutriment, if I may use the term, is most strengthening, and the animal will, by it, be able to endure great exertion for a longer time without being distressed for wind; the lean part of good flesh, for instance, is better than the fat part of it, though the latter may possess more nutriment in quantity than the former, yet the former be of better quality; the fat part will produce more fatty matter than the lean part, both externally and internally, and will require more exercise to give the external flesh its necessary firmness of texture, and to clear the internal organs so that the chest may expand, and the circulating fluids may not be oppressed; besides, as all sebaceous substances offer a great resistance to the gastric juice, fat flesh is harder of digestion than clean or lean flesh.[1]

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pletely changed; and in cows it undergoes a two-fold mastication, by their *chewing their cud*, which also will cause it to be more perfectly digested.

[1] Bacon, though all fat, is very easy of digestion; pork is easier of digestion than beef or mutton when eaten as soon after being killed as those flesh meats generally are; bacon being kept many months makes it more tender and digestible, which, with the addition of being decomposed by salt, renders it still easier of digestion, and is very suitable food for men to dine upon who have afterwards to labour hard, as in harvest time, for instance, mowing, pitching hay or corn on to the waggon, &c., which is very heavy work; they cannot do so well if fed heartily upon beef or such food, the latter is more suitable for their supper. Bacon for a dog would act similarly to gelatine.

Dry wheat or oatmeal, finely dressed, affords more nutriment than the same substances fermented and baked into bread, by which a portion of the nutriment goes off by evaporation; and if a dog would lick sufficiently of the dry meal to give him, with his proper portion of flesh, a full meal, he would be in good, firm flesh, and muscular strength and good wind, and would be in nearly as good condition as with any food you could give him; this I have tried, and with every satisfactory result, with those greyhounds who would lick plentifully of it. This is confirmed by observing dogs kept at a corn mill, of which I have known many instances, where they are always in good health, and full of firm flesh. The dust which rises from the spout where the flour comes from the millstones when the corn is grinding, falls and settles in different parts of the mill, on the *hurst*, (as the frame is termed) on the floor, and elsewhere; this is the finest portion of the flour, and the mill dog gets into a habit of licking it up, which, with drinking water at pleasure, and occasionally meeting with a few bones, keeps him in excellent health. I know one that has nothing else, and keeps himself quite fat.[1] The same flour or meal, however, it must be acknowledged, mixed with good broth, the fat being skimmed from it, must add to the nutriment, and the inconvenience from what little increased disposition that would give the food to produce fatty instead of firmer flesh, would be counteracted by the benefit of the broth being warm, enabling you to give the dog warm food, which is stimulating to the stomach.[2]

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[1] I once kept a greyhound puppy for a friend, when I had a corn mill; she came to me when about six months old, in the name of *Convict;* being not very promising in appearance, she was hypothetically deemed to run with a halter round her neck. She soon got in the habit of licking the dust from the floor and other parts of the mill, and with occasionally some milk, which the miller, who was fond of a dog, gave her, and a few bones, for she had occasion for nothing else, she grew very well, and turned out so excellent a greyhound, that the same parties who christened her *Convict* afterwards changed her name to *Convince;* she convinced them that her performance was better than her former appearance had promised.

Savary says, "Hounds readily support themselves with dry oat or wheat meal."—*Arrian Translated*, p. 92.

[2] Oatmeal is heating, and should not be given too plentifully, but mixed with vegetables or other food of a more cooling nature; potatoes boiled and broken down are a good mixture with meal for common purposes.

But to return to cowheel; there are many sound objections to it in theory, notwithstanding that in practice I know many greyhounds that have run successfully upon it; but that is no conclusive proof that the same kennels would not have been *more* successful with a proper proportion of flesh and pudding without liquids or cowheel. They may have run against those of a worse breed, worse reared, or worse trained, of which there are many instances; but I do not know of them being generally successful against those fed on a proper proportion of flesh and pudding without liquids; for it has not fallen to my lot to know of any courser who pursues that system of feeding, though there may be some that do; some give flesh too plentifully, and broth a little thickened with meal, but not enough to deprive it of its liquid consistency; and some medical practitioners suppose that broth, containing much glutus, does not mix with, and weaken the gastric juice, as water will; Magendie, however, will inform them, that broth very soon after getting on the stomach, undergoes a separation of the watery part (which soon passes off the stomach) from the nutritive part; the latter forming a coat of aliment on the stomach, which, in due course, is converted into chyme; so that the watery part of broth, when taken in quantity, which it is in that way in much greater proportion than when mixed with meal to a consistency of stiff pudding, has nearly as baneful an "effect in impeding digestion of the flesh, as if taken in its simple watery state."[1]

Broth, however, with only cowheel and biscuit, is not so objectionable on the score of impeding digestion, as with flesh; the former being so much easier of digestion than the latter. The principal objections to cowheel broth and biscuit may be confined to four; first, they do not together form a food of so good and stimulating a quality for the purpose they are given, as flesh; secondly, the broth and cowheel itself, have each a tendency to produce fatty instead of firm flesh; thirdly, they are all three of about the same digestibility, and by being all converted into chyme at about the same time, the nutriment is consequently conveyed to the heart, and enters the blood nearly all together, forming a large body of nutriment, thrown at once on the animal frame, which increases the fattiness of the flesh more than if the several parts of that nutriment had come progressively and gradually into the blood; and fourthly, they are filled full as they will eat of this light food eighteen, twenty, or twenty-four hours before running, in order that they may be sufficiently empty when they do run, when that time is all in all sufficient for that purpose, had they been fed partly of flesh, which takes much longer to digest; their stomachs become empty too soon, and the dog becomes restless, and craving for more food, by which both his strength and his spirits are in a degree deteriorated at the very time he is required to display the greatest degree of fire and vigour.

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[1] Of water, Magendie says, "During its stay on the stomach, water assumes an equilibrium of temperature with the sides of the viscus; it mixes at the same time with mucus, the gastric juice, and the saliva which are found in it; it becomes muddy, and afterwards disappears slowly, without suffering any other transformation. One part passes into the small intestine, the other appears to be directly absorbed."

In the selection which takes place in the stomach of the different aliments upon it, those which are soonest converted into chyme, no matter whether taken on the stomach the first or the last, pass off the first into the duodenum, and in regular course are distributed over the whole body by the blood; in their different degrees of digestibility, if bread, or pudding, vegetables and flesh are all taken on the stomach together, the bread will pass off first, and perhaps in little more than an hour; thus the stomach is lightened of part of its load, and the dog is so far relieved from its pressure and distension, which is in about the same time as the whole full meal would go off, if consisting of cowheel broth and bread; neither the vegetables nor flesh go wholly off at the same time, as the fibrous part of both offer a stronger resistance to the gastric juice than that portion of the aliment which fills the intervals between the fibres; thus they go off at different intervals, and the nutriment comes into the blood progressively; the vegetables between that of the bread and the flesh; that part of the flesh most easily digested is seldom converted into chyme in less than five hours, according to Magendie and Sir Astley Cooper. That is, nevertheless, plenty of time, according to Drs. Ferguson and Teulon, and confirmed by other authorities, for the whole nutriment to be thrown over the entire body, and the dog to be sufficiently empty to run, even though not fed till evening, and having to run the next forenoon, or towards noon. Of the truth of this, I am convinced by my own observation in recent instances, where they have run their courses in superior style, recovering their wind immediately afterwards, and appearing nowise distressed, though some of the courses were long and severe; the dog has a portion of food for some hours longer on his stomach, and consequently rests quietly, and is comfortable in his bed, and comes to his work with flesh on his bones of a firm texture, assisting both his speed and his wind.[1]

The philosophy of the subject is in favour of not overloading the stomach with food, inasmuch as the stomach is composed of a muscular sack, and like all other muscle, becomes exhausted and debilitated by too long bearing a heavy burden, which reduces its energy, and weakens the digestive powers; consequently, as flesh and bone appear quite as much or more the natural food of a dog than any other, by his voracious and greedy manner of eating it, more so than he does other food, so will he, if left to his own guidance/ eat of it till he has loaded his stomach to an injurious degree, and unfit him for violent exertion.

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[1] Some months after writing the above, an excellent greyhound bitch was sent to me, but very lean and poor, though apparently in good health; she was put to the same feeding as others she ran with in three days after she came to me, and was improved in her appearance in the time; the one she first ran with was so fresh, that most coursers would have deemed her *too fat*, which if so, certainly would be unfavourable to her wind; but at the end of a severe course, she had her tongue up, and completely recovered her wind at least five minutes before the leaner bitch had; under all the circumstances I could deem this difference between them to be accounted for in no other way than the lean bitch being deficient of muscular support, and consequently having earlier distress for wind in her course. The reason of her being so lean as afterwards turned out, was her being for some weeks previously confined in kennel, and being generally accustomed to run at liberty most of the day about the yard, she did not rest well in the kennel.

Here we see the necessity for muscular support, and to attain that, for the dog to have good rest, as well as proper food and exercise.

But if he is only fed with half the quantity of flesh he would eat if left to himself, and his full meal made up (so as to satisfy his appetite, and cause him to rest well,) of lighter yet nutritious food, of different degrees of digestibility, it in a great measure removes the philosophical objection to a full meal; for only one half of it being flesh, and the other half vegetable substances, much easier of digestion than flesh, and also lighter in weight, though the stomach is filled, it is altogether not so heavy as if filled with flesh alone, and consequently not near so oppressive a load to it as a full meal of that food with which he would fill his stomach if left to his own guidance; in addition to which, by the greater digestibility of a part of the food it is sooner relieved from a part of that weight, and may virtually be considered as *much less* than a full meal of a dog's own choice food. This consideration also removes the objection which some coursers may urge against mixing different kinds of vegetables with the broth, oatmeal, &c. to form a pudding for them, as an inducement to the dog to eat more of it, by those vegetables imparting more flavour to the pudding than it would have without them; for either with or without those vegetables, he will not eat so ravenously or overload his stomach with such a weight of food as he would on flesh alone. The only thing required to answer the objections to a full meal either in theory or practice, if you can happily combine a proper proportion of each substance, is to make the dog leave off eating with a small degree of appetite.

The following receipt has been handed to me, which I insert more as a curiosity than as a recommendation of its suitableness for the intended purpose, some parts of it being very proper, and others perfect nonsense; very much trouble and expense without any but imaginary benefit.

" First day, half an ounce of cream of tartar in some bacon fat, or in some skimmed milk.

" Second day, the same.

" Boil a cow's liver four hours, hang it on a rack to dry, boil two ounces of isinglass in four quarts of new milk twenty minutes, add half a stone of the best flour and twenty-eight eggs, and bake the bread well. Every morning toast some bread soaked in lard, and give to the dog with some liver, and at night toast a slice of bread, and give it with the milk and isinglass.

"Boil three pints of old ale well, and skim it till fine; add two ounces and a half of sugar candy, and one ounce of Spanish juice. When dissolved, let it stand till half cold, then add three quarters of a pint of the best sweet oil, and stir it well together. The night before exercise or coursing, toast a slice of your bread well, and soak it in the oil mixture, and give to the dog a little of the same next morning; keep your dog warm, and dress him well down."

Another food for greyhounds in training used by Mr. Dale, of Wirksworth, is much better worth the attention of coursers:—

"Get a lot of sheep's feet, and other feet if you like, get the hair off, chop them into small pieces with a hatchet, boil them well down with other broken meat, and add a few potatoes and a little meal."

These substances are stewed down to a jelly, and is the best jelly food I have met with. The sheep's feet will of course take a long time in stewing down, and the principal alteration I would make in it is not to put *broken meat*, if by such is meant meat previously cooked, but fresh meat, and that put in after the feet have been stewed for some time, as one hour's stewing will be sufficient for the flesh, and the potatoes previously boiled and mashed with good fine wheaten flour instead of oatmeal, mixed with the broth while warm to a stiff pudding, or put in the last half hour while stewing.

This will make a good substantial, strengthening mess for a dog, possessing variety of nutriment of different degrees of digestibility, which will answer all the purposes required, according with every known principle, both philosophical and practical, and is far preferable to the ingredients in the former receipt, (which is a mess for a mad dog,) of ale, sugar candy, Spanish juice, isinglass, milk, and the wasteful expenditure of eggs, twenty-eight to half a stone of flour, losing a great portion of their nutriment by evaporation. Two or three raw eggs for a dog a few hours after his full meal, are attended with other benefits than their nutritious qualities; being so good a refrigerative, they prevent the dog becoming thirsty, and less prone to lap water wherever it comes in his way, and is of more benefit to him than five times the number mixed and baked with his bread.

An eminent courser, celebrated as an excellent trainer by those who do not know the true principles of training, as well as in his own fancy, when they have an intervening day of rest between coursing days, gives a slice of mutton the day the dog has been running, (when if flesh is prejudicial at any time, it is at that precise time,) and no flesh the day before running, (the time of all others that it would be most beneficial;)[1] his other food is cowheel, cowheel broth, and bread composed of wheaten flour and oatmeal mixed up with strong broth from sheep's heads and plucks boiled down to a jelly, instead of plain water, the liver cut into bits and mixed with it, and *only* one hundred and twenty-eight eggs to two stones of flour and meal—food rich enough to *poison a cat*, or nauseate any dog.

On the subject of jelly and compound food for greyhounds when in training for the greatest possible and long continued exertion they or any animal can undergo, Mr. Drewry, a scion of a true old sporting stock, jocosely observed, that such food ought to be denominated *champaign food;* it raises the spirits and energy for a time, but its effects are soon gone off, and will not support their strength for any lengthened or oft repeated violent exertion. It reminds me of a remark made by the modern Nimrod in the Sporting Magazine, who had attended the Amesbury coursing meeting, and dined with the club, the only wine of which they had been drinking was claret. He said, "Claret, and nothing else but claret, is not quite so well. Half a dozen glasses of good old sherry during dinner, and a pint of good old port wine afterwards, would sit much better on an Englishman's stomach, after being six or seven hours on Salisbury Plain." So would a proper portion of flesh and bone, with vegetables and bread, support the greyhound's strength during his arduous struggle to take the hare, much longer than this champaign food. If his owner prefers an expensive to a cheap food, he may, instead of horseflesh, give him good roast beef, mutton, or venison, and add currant jelly and wine sauce, over which, no doubt, the dog will lick his lips, and enjoy his meal most admirably, and a glass or two of old sherry wine afterwards. In short, on the nature of the animal, his constitution, and the state of his health, depend what description of food is the most suitable and strengthening for him.

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[1] The day they have been coursed is the most likely time to have fever in their system, which flesh will increase; if fed without flesh that evening, their stomachs will be in better order to digest flesh on their intervening day of rest, which flesh will support their strength better for the following day's coursing.

Long after the foregoing pages were written, and while this volume was printing, I have met with a very satisfactory confirmation of flesh giving more strength to the animal fed upon it, than jelly or compound food will give him. In the Penny Magazine, published by the Society for the diffusion of useful Knowledge, March 1835, is the following article:—

"*Muscular Strength of Man as affected by Diet.*

"A series of experiments have lately been made in France, with a view of determining the effect of gelatine as an article of diet; in the course of which, as we learn from a paper read at the Academy of the Arts and Sciences, Paris, the following results were obtained. It must be observed, that gelatine is the jelly extracted from animal substances, by boiling them in water; and M. Edwards, by whom the experiments alluded to were made, considers isinglass as pure gelatine; but it was ascertained, that though highly nutritious under certain circumstances, it resembled bread and some other articles, in being unable to sustain life by itself alone. Bread and gelatine together form a nutritious aliment, but they are insufficient to sustain the vigour of the body in a proper manner. When, however, gelatine is flavoured by the sapid and odorous parts of meat, it then possesses highly nutritive qualities, and not only sustains the animal powers, but occasions their greater development. In the course of his experiments, M. Edwards availed himself of the dynamometer, a little instrument probably consisting of a steel spring coiled into a spiral, which, if pressed upon with all the force a person possesses, becomes compressed, the degree to which this is effected being pointed out by an index. It was ascertained in this manner, that during the first half of the day, the muscular strength is continually increasing, while, during the other half, it is progressively diminishing; and that this development of the bodily powers was the natural process of the animal system. Another series of experiments was tried, with a view of estimating the muscular force immediately before breakfast, and immediately after that meal. The mean result of eight days' trial upon the same individual was as follows:—78·8 degrees before breakfast, and 80·5 degrees immediately after it. The meal consisted of a cup of chocolate and a small loaf. On the same individual taking, during three successive mornings, a similar quantity of water instead of chocolate, it was found that a diminution of two degrees was occasioned by the alteration. On sugar being added to the water, the effect was the same, though not quite so decided. The chocolate, prepared with sugar, and the customary quantity of water, was now substituted, which created an additional degree of strength, amounting to 3·7 degrees. The chocolate and bread were therefore the sole nutritious properties of the meal. Common broth was next adopted as a diet; and first, the effects of warmth were ascertained distinctly from that of the broth itself. Eight ounces of water were drunk at a temperature of 104° Fahrenheit, the ordinary temperature at which broth is taken. The dynamometer showed that the muscular strength had been diminished 3·3 degrees by the heat, in addition to that produced by the water simply. The effect of good broth, even at this temperature, was found to increase the force of the body six or eight degrees. The general conclusions established by these experiments are, that the muscular force of strong men is increased after a moderate and wholesome meal; on the contrary, persons who are weak from illness, old age, or youth, or by their sex, lose strength directly after a meal. This elevation or depression of their powers immediately after taking food, must be distinguished from the subsequent effect of the digestion—an operation which concentrates the bodily energy towards the stomach, and consequently counterbalances the previous effect. The dynamometer indicates the difference between these opposed forces; this difference is less among weak than among strong persons. In an experiment on the inmates of one of the hospitals at Paris, it was ascertained that soup composed of gelatine, instead of diminishing the strength of weak persons, as the whole meal does, gave an increase to the men of two degrees, and to the women of three;[1] and by using a double quantity of gelatine (four ounces) a further increase of strength was afforded."

These experiments amount to proof positive of the greater strength acquired by animal food in its ordinary than in its gelatinous state, and is an invaluable occular demonstration for the guidance of coursers when their greyhounds are required to possess the greatest possible power, speed, and fine wind. In the summer season there is less objection to feeding lightly twice a day upon easily digested food instead of once, and then having a full meal of more substantial quality; summer also admits of exercise twice a day, with more advantage than winter, namely, in the cool of the morning and the cool of the evening, resting in a cool kennel during the heat of the day; you want the dogs cool and quiet, and the days being long, allows time for feeding, and the food to digest well before taken out to exercise a second time. But in the winter season the case is entirely different; you want to stimulate and strengthen them both by food and exercise, in which warmth is essential, and the days when wanted to course are generally the shortest and most chilly of any part of the year; they require an hour or two of exercise in the first place, cleaning and brushing, and after a small portion of warm broth to nourish their stomachs, and enable them better to perform the digestive functions on their more solid food, resting an hour or two before that solid food is given, to be warm, and the gastric juice secreted in more plenty, and its energy increased; then resting three hours after being fed, they are then not in a fit state for a second strong exercise, such as is prescribed by the advocates for feeding twice a day, as it is "when chyle is formed that nature invites to healthy exercise;" and according to Magendie's experiments, it is not till five hours that the whole of the flesh is fully converted into chyme, even if so soon; a further process is required to form chyle, consequently a further time is necessary before "nature invites to healthy exercise;" the exercise prescribed by the advocates for feeding and exercising twice a day is four or five miles each time, "great part of which should be on a smart trot;" consequently, from the time required for exercise, resting after it before they are fed, resting after feeding for the food to undergo its digestion in the regular and natural course, you must, in those short days, be the weather how it may, either give them their first exercise before day-light in the morning, or their last after dark in the evening; and in the latter case, or indeed in either, the dog has not his food so soon as you wish in order to his being sufficiently empty to course next morning.[1]

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[1] This clearly shows that gelatine is an improper food for a healthy, robust dog, however suitable it may be for a sick or delicate one.

Some advocates for two half meals, instead of one full meal in a day, are yet advocates for only one meal the day before coursing, and that they say should be about twenty-four hours before he is put down to run, in order that he may be empty, and may therefore fancy they reconcile this inconvenience by feeding only once the day before coursing. Now Magendie clearly proves, in a variety of cases, that habit in any living thing exercises a very powerful influence over nature, and accords with the common adage, that "habit is second nature." But if dieting an animal according to his habitual mode of living, is admitted to be an advantage, dieting him contrary to his accustomed habit must be a disadvantage, until his new system of dieting has become habitual; and surely to change this habit only the day before he has to perform his greatest efforts, where his best powers of strength and fine wind are called into requisition, must be the furthest from utility. The question, however, if question it can be deemed, is, which of the two habits is best to be pursued in training, to have its best possible effect when that best possible effect is required; namely, to run his emulative matches; and that habit which is most consonant to nature and the organization of the animal's frame must be the preferable system, unless we prefer second nature to the first. Nature never could intend an animal that it had provided with a stomach of such great capacity to have that stomach only half filled. The greatest gormandizers are more so by habit than by natural constitution, and by long indulgence in that habit, and increased distension of their stomachs from time to time, their stomachs become morbidly large, and require gradually contracting within their natural compass, which, being accustomed for a length of time to less quantities, will effect.

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[1] If a dog must be fed upon light and speedily digested food, or if he is fed wholly on flesh, the objection to giving smaller quantities, at two or even more times a day, is not so great; it may even be advantageous to do so, as the aliment would come more gradually into the system; yet neither way is so good as giving him one full meal of different degrees of digestibility, as that is the only system of having him in the best possible state of health, strength, and condition, and it is the only system by which the whole organization of faculties can be brought to coincide, and not act in opposition to each other.

Light and easily digested food, repeatedly given in moderate quantities, would not interfere so much with digestion and frequent exercise, nor so much impose a double task on the stomach of performing two operations at the same time; beginning a new task before it had finished the old one; but it would neither allow the dog such uninterrupted sleep and rest in the night, nor support his strength during the eight or ten hours' absence from his kennel in the coursing field, and on his road to and from it; and his stomach would be more exhausted, and less able to perform its task to support his strength the following day, when he has two or more successive days' coursing. Flesh repeatedly given him in the day in small quantities would not disorder the stomach by weight so much as a full meal of it would, and would allow the dog rest in the night, and support his strength next day; but it would interfere with digestion and exercise, break in upon the regular routine of the circulating fluids, and impose the double task on the stomach of performing two operations at the same time, before the fresh secretion of the gastric juice has regularly taken place.

I have, independent of practical coursers, found more difference of opinion amongst gentlemen of the medical profession on this subject of two half meals, or only one and that a full meal in a day, than on any other important point. Those who advocate two half meals, say "they would give a certain quantity each time." A man preparing for the prize ring is allowed at least two meals a day, and it is considered more judicious than only one meal, though men have attained great age eating only once a day.[1] A horse is allowed to eat oftener than once a day when in training, and why not a dog?

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[1] Louis Cornaro, a Venetian nobleman, who being given over by his physicians at the age of thirty, lived to the age of one hundred and five

A comparative reference to the difference in the capacity of each individual stomach, and the organization of the digestive process in each, will answer that question, and prove, that instead of rendering them parallel cases, will, on the contrary, show the utility of feeding the dog on only one meal a day, and that a full meal, while at the same time it is absolutely necessary for the horse to be fed much more frequently, each feeding requiring much longer time than that of the dog; and a corresponding difference with man between the two others. It may also admit a fair inference that nature, in providing the horse with a stomach of such small comparative capacity in proportion to his size, length of time necessary to feed, reciprocal with the necessary time for his rest, sufficiently to sustain his powers under his labour, is because his labour, and violence of exertion, is so great and of so long duration, that the aliment should be conveyed gradually into his system, in order that he may receive his nourishment progressively, and that his muscular support may be the greater, by that gradual nourishment giving him flesh of a firmer texture, instead of fatty and soft, which would be the result of that nourishment being conveyed to the system, and thrown upon the body nearly all at the same time; in support of which, the natural food assigned to him possesses not much difference of digestibility, and therefore the longer he eats, the more gradually is the nutriment thrown over his frame, adding gradual support during his exertions, one portion of his food undergoing its process of digestion, and being carried forward into the system after the other.[1] Herein is derivable some analogy between the two different modes practised by different coursers in feeding their greyhounds; one mode, that of giving cowheel, bread and broth, without flesh, all of which are converted into chyme in a similar space of time to each other, and thrown nearly all at once over the animal frame, and they give fatty flesh on the body; and the other mode, bread or pudding, vegetables, flesh

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years, by adhering strictly to a regimen which limited him to fourteen ounces of food daily, to which he added six or seven glasses of port wine.

[1] A man who is a good walker will travel more miles in a month than the best horse; though the latter, for one, or a few days, will travel a much greater distance than the former; simply because the horse requires so much longer time to feed and rest than the man does.

and bone possessing such various degrees of digestibility, by which the nutriment is thrown upon the frame at intervals, progressively nourishing the body, keeping the stomach free from exhaustion, by having a portion of aliment remaining upon it for a longer time, and imparting a more solid and firm texture of flesh, possessing greater muscular power.

In order to a more full and proper understanding of this point, it is necessary to state what Magendie and other physiologists agree upon, namely, that while life remains in the animal there is a sort of perpetual motion, or continuity of change taking place in the system; this they are generally agreed upon, though there is a difference of opinion as to how long a time is required to effect a complete change; some say that in seven years we have not a particle of the same flesh, skin and so forth on our bones, which we had at the commencement of that period; this is controverted by the tattooing and branding of natives in some countries not being completely gone off in that period, though the appearance of them is materially changed, and the marks much less visible; nevertheless, that alteration in the appearance of those marks is a confirmation of that continuity of change taking place, which fact ought to be borne in mind in the training of the greyhound, or any other animal required to be in the greatest perfection of strength and condition. The old flesh progressively goes off in the excrement and by other means, and new flesh formed by the aliment is taken daily on the stomach. Thus when an animal is getting fat, increasing in weight, there is more new flesh daily created than old flesh going off; and on the other hand, when getting lean and lighter in weight, a greater proportion of old flesh is going off daily than new flesh formed. The stomach may be considered the fountain from which the aliment flows into the system; and the heart, the captain, as Falstaff would say, or primary agent in its distribution; there must, for the animal to retain his full vigour, be some aliment on the stomach for one to act upon the other; the stomach to act on the aliment, and the aliment to act on the stomach, or the fountain will be dried up, the blood will become weaker, the flesh waste, the muscles relax, and the fire and energy, so essential in a greyhound, would be enervated and reduced; for it is by this continuity of change that those faculties are kept in a healthy and vigorous state.

The circulating fluids being in a proper state, and the body, both externally and internally, disencumbered of any superabundance of fatty matter, the stomach itself has but little other effect in impeding the respiratory organs than by being so distended with food as to press the diaphragm, between which and the ribs the lungs are situated, so as to leave less room for the play of the lungs; and certainly with the greyhound, whose exertion is of the greatest order while he runs, his whole animal fibre being at its utmost stretch, and all his physical powers required to be in the greatest energy, from the commencement to the termination of the course, requires his lungs to be as free from obstruction as those of any animal whatever; yet such fineness or greatness of powers being required in him, is so much greater a reason against any one faculty being weakened, and least of all, the fountain from which all his strength is supported, the stomach, which ought to be in a perfectly healthy state; for if disordered, it disarranges and disorders every other faculty in a proportionate degree; and to talk of his being entirely empty when he runs, which many do, is idle; we all know that we feel exhausted and unnerved with long fasting; that enervation commences as soon as the stomach becomes empty, and though experienced but in a trifling degree, if that commencement only takes place when a greyhound is put down to run, it is precisely at the time he is wanted to be in the greatest strength and vigour; then how much worse must he be if taken out empty in a morning, and have to run two or three courses, or even only one, at the latter part of the day?[1]

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[1] Race horses are fed by some trainers but a short time before they start; I recollect seeing a sporting Baronet looking at his horse in the stable a little time before he was brought out to run at Doncaster, and the trainer was giving him corn. "What," said the Baronet, "are you feeding that horse for? He is going to run." "We always feed them before they run," said the man. "Well," said the Baronet, "of this thirty or forty years that I have been on the turf, I never knew that before."

Many trainers of greyhounds argue on a false hypothesis, from ignorance, similar to that of the worthy Baronet.

With respect to the utility of feeding a dog more than once a day, being strengthened by the horse in training being fed oftener, it does not appear that any analogy subsists in that respect between the two animals.

The Sporting Magazine, December 1829, p. 79, has an article, by that intelligent writer, the modern Nimrod, wherein is recited some remarks on the stomach of a horse, from the lecture by Mr. W. Percival, by which it appears, that the stomach of a horse is smaller in proportion to his size than any other animal we know of; the organization of the ass's stomach, however, is similar, and so is allowed in anatomy, digestion, and in other respects. "Mr. Percival plainly shows," says the writer, "that nature must have intended this animal for the greatest exertions of speed, from the care she has taken in the formation of this essential part. First of all," says he, "let us inquire why nature, who has given four stomachs to the ox and sheep, should have restricted so large an animal as the horse to one, and should have made that one much smaller, in comparison to the bulk of the body, than those of man or quadrupeds in general; a fact of which I have already given some demonstration by actual comparative admeasurement. And what makes this investigation more curious and interesting is, that although the stomach of the horse will contain so little, his consumption of food is not only greater than that of carnivorous and many other animals, but the aliment on which he lives is of that kind which necessarily occupies very considerable space, either in or out of the body. A man will probably consume about a pound and a half of solid food at a meal; a horse we will say about six pounds, all or a greater portion of which may be hay; and this, in respect to bulk, will occupy twelve or even twenty times the space that a pound and a half of any sort of cooked meat and vegetables will; and yet the stomach of the latter will not contain three times as much as the stomach of the former.[1] One natural and self-evident conclusion from the foregoing fact is, that the food which a horse eats cannot remain long on his stomach; that portions of it must successively pass into the intestinal canal, at short intervals, during the time of feeding, in order to make room for those last swallowed. It would appear, then, that the stomach of a horse, in comparison to that of other animals, *is made proportionably small, in order to render him more effective as an animal of speed and burthen*, and is of course more useful for the various purposes for which he is employed by man. In the horse *the gastric process of digestion is very active*, and it is necessary that it should be so; for being an animal that feeds beyond what in others constitutes satiety—*distension of stomach—chyme must be continually flowing out, in order to make room for the aliment he continues to take in.* Of course the duration of the process varies with the nature of the food."

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[1] The stomach of a middle sized man will contain *more* than three quarts of water, whereas that of an ordinary sized horse, whose body exceeds his own in weight and bulk by eight times, will not hold three gallons, or less than four times the quantity of the man's; so that a man's stomach is at least twice as large in proportion to his size as that of a horse.

It will be seen, by what follows, that Mr. Percival is wrong in his assumption, both with respect to *the activity of the gastric process of digestion in the horse*, and in supposing that *chyme is continually flowing out of the stomach to make room for the aliment he continues to take in;* for if he were right in that, what must support the strength and vigour of the hunter during the ten, twelve, or fourteen hours he is very frequently absent from his manger? The fact is, that the food undergoes only a portion, and that a small portion of its chymification in the *stomach* of a horse. The phenomena in a dog and the human species present the same

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A dog, a greyhound for instance, will eat three or four pounds of solid food of the same kind as a man, while the latter is three times the weight and bulk of the former, leaving the dog's stomach in proportion to his size at least six times as large as that of a man, the man's being at least twice that of a horse, brings the dog's stomach (at the very lowest computation) to twelve times the size, in proportion to his weight and bulk, to that of a horse.

The horse is some hours in eating a full meal; the dog not many minutes; yet each calculated to afford a graduated continuance of support to the animal system; the former by a continued digestion of food, of but little variation in degrees of digestibility; the latter by the many degrees of digestibility, his natural food containing a variety of aliment.

appearance, and experiments are tried on the former for the better instruction of treatment for the latter; so it is with the ass, and the more valuable animal, the horse.

"December, 1823.—A young female ass was taken from grass, and kept fourteen hours without food or water. A quartern of oats was then given to her, which she ate in about twenty-five minutes. Six hours afterwards she was bled to death. The stomach contained both *grass* and *corn;* the former occupied the vascular part, and the boundary line between it and the corn, which all lay in the culicular pouch, and precisely corresponded with that formed by the borders of the sensible and insensible linings. The grass was dark coloured, soft and pulpy, and had much the appearance of chopped spinage. The corn preserved its colour, was sheathed in a large layer of mucus, was humid, and emitted a faint sour odour." "We may conclude from this," says the writer of that article, "that no danger can arise from a hunter being absent ten or twelve hours from his manger." That conclusion will be further strengthened when we consider, what is known by experiment, that digestion goes on much quicker when the animal is at rest, which must be inferred was the case with the ass, than when at work, which the hunter is when absent from his manger. Chyme is not formed in the stomach of a horse, except when he eats no more than his stomach will contain, and is kept from more food for a length of time.

Digestion goes on more rapidly in the dog than in the horse, and, according to Magendie, more rapidly in the man than in the dog. Of the two latter he says, "The vacuity or the distension of the stomach has an influence upon the duration and intensity of the contraction of the œsophagus." He adds in a note to it, that "These alternate movements of the œsophagus are not found in the horse; but the crura of his diaphragm have a peculiar action of the cardiac extremity of that tube, which does not take place in animals that vomit easily—its diaphragmatic extremity, for an extent of eight or ten inches, is not contractile in the manner of muscles. In the horse, the splenic portion of the stomach is more contractile than the pyloric; so that the aliments remain but a short time in the stomach of that animal, and digestion is performed, in a great measure, in the intestines." It thus appears, that in the horse, the intestines perform a considerable portion of the functions, which, in other animals, are performed by the stomach alone. The stomach being of small capacity, and neither so contractile nor consequently so expansive as that of other animals, tends to confirm what Mr. Coleman advances, namely, that "the horse is the only animal that can be compelled to take violent exertion after a full meal." The horse is enabled thus to take more violent exertion after a full meal than other animals, because his stomach, being so small, and incapable of expansion, offers less obstruction to the action of the respiratory organs, than the more large stomachs (in proportion to bulk) of other animals.

This want of contractibility and corresponding expansion in the stomach of a horse, unlike that of other animals, which yet seems necessary, and corresponds with the organization of the digestive process, will account for some things speculated upon, and on which various opinions are held, but on which the effect on digestion by this structural peculiarity has not formed a portion of the consideration given to them in any work that has fallen under my notice.

In the dog, the man, and in various animals, the stomach, by the contraction and relaxation of its muscles, closes in upon, and presses the food; and the irritation from the action of the lungs, and consequent pressure from the diaphragm, are secondary agents in assisting the digestive fluids. The absence of that portion of assistance from these secondary agents of digestion in the horse, is one cause why digestion is not completed in his stomach as in that of other animals; yet the splenic portion being more contractile than the pyloric, seems necessary to impel the food through the pylorus, to make room for the horse to take in more food. The small intestines of the horse are very much wider than those of a cow, whose stomach is much larger than his; the aliment in the small intestines of a horse presents the appearance of chyme much more than that in his stomach does; while, in a cow, the small intestines have the appearance of being filled with the excrement more than any appearance of chyme, and it may be doubted whether chyme, as a distinct mass, is ever completely formed in the horse's stomach. More of this, however, hereafter.

Mr. James White, in his Farriery, says, "It has been said by eminent physiologists, that the energy of the gastric juice is in an inverse ratio to the strength of the muscular coats of the stomach. Now the horse's stomach, when healthy, is probably stronger with respect to its muscular coat, than that of other animals; therefore the digestion may depend *more upon the muscular power of the stomach than upon the gastric juice.* On opening healthy horses that have been killed in consequence of having met with some incurable accident, we find not only the stomach with this strong muscular structure, but likewise the small intestines, which are sometimes so thickened in certain parts as to feel almost a solid body; which proves, I think, that the whole of the small intestines are concerned in the digestion of food as well as the stomach, and in both the *absorption of the nutriment may be going on.*" This strong muscular coat of a horse's stomach tends to confirm what is said by those physiologists, as it is known by practical experiment that the digestive process in that animal is not so active as in some others; and therefore Mr. White furnishes an additional reason in theory to the less contractibility and distension in their stomachs than in other animals, for its being so inactive; yet under the erroneous but common idea, I know not how derived, of digestion being carried on rapidly in the horse, he supposes that it may *depend more upon the muscular power of the stomach than upon the gastric juice,* in which I conceive he is wrong, as digestion in the stomach cannot be much indebted to its muscular power when it is so little contractile.

Mr. Blaine, seemingly aware of this, and also aware of the necessity for the secondary agents of pressure and irritation in promoting digestion, describes certain parts of the stomach to be *plicated* to admit of greater distension. The correctness of this inference, however, is doubtful, and seems a sort of forced assumption to reconcile this formation of structure with the generally erroneous idea of the horse's rapidity of digestion. Instead of digestion in the horse being principally performed in the stomach, which Mr. White, before stating the above quoted from him, says it is, and which it will be hereafter seen that Mr. Blaine also considers, I believe, with Dr. Magendie, that it is principally performed in the intestines, and upon the whole is altogether peculiarly slow in its process. The absorption of the aliment, as from the duodenum of the human species, must, in the horse, go on from the intestines, and little or none from the stomach. These considerations on the organization of the horse's stomach, intestines, and digestive process correspond in theory with the facts known by practical experiments, and prove that the digestive juices possess less energy in that animal than in the man or the dog.

Having gone so far or further than necessary on this subject for my own object, namely, an investigation of the comparative organization of the horse and that of the dog, I may yet be allowed, while on the subject of the horse, to digress from my own subject, in order to throw out an idea that has often occurred to me, for the investigation of those competent to the task, on the subject of that malady peculiar to this animal, called broken wind, and why the horse is more subject to that malady than the cow or other animal; namely, whether the origin of it is not to be found in indigestion from this peculiarity of structure, or want of contractibility in his stomach more than in others, and the strong muscular coat of the stomach and small intestines? I am aware, that the seat of the malady is considered by many to be the air cells of the lungs, and probably, correctly so; but it does not originate there; it must have an origin somewhere; and the immediate or proximate causes arising are not improbably from some long continued ŏbstruction to the action of the lungs, which may anterially arise from different causes. The want of contractibility in the stomach is evidently one cause of the inactivity or want of energy of the gastric juice; the strong muscular coat of the stomach and intestines appears to be another cause; these two, and the known long time the food is before being completely digested even when that food is of good quality; these causes combined with bad food, or almost indigestible bad hay, to which horses are sometimes confined for a length of time, without purgatives or anything to assist nature to get rid of it; filling the blood with impurities, and the body with humours; the excrementary canal with an accumulation of indurated fæces, and the alimentary with hardened substances of undigested food, and wherewithal compelled to great bodily labour and violent exertion, are enough to cause obstruction and serious injury, by ruptures or otherwise, to the lungs. This effect would probably not take place if the food were of good quality; but we know that they very often have food of an inferior and sometimes of a very bad quality. A bad cold or other causes may produce indigestion in a greater degree in the horse than other animals from this peculiarity of structure of the stomach. That effect would not take place to such a degree even with inferior food, did the gastric juice in the horse possess the energy which it does in some other animals, but the want of which in the horse, from the stomach not being contractile like other animals, and the strong muscular coat of the stomach and small intestines, is at least part of the reason of that inactivity of the digestive process. We know that horses are turned out to grass for a month or two, without showing any particular defect of wind at the time, and yet come up again completely broken winded. Green grass, in a few days after being turned to it, in a healthy horse, generally acts as a purge; a horse disordered by bad food, is, by many, turned to grass as the best remedy, but which is not strong enough as a purgative to work its way through the accumulated obstacles above named in so short a time as is desirable, even if it can readily penetrate to the principal seat of digestion, being hindered by the intestines being partly loaded with indurated substances; add to which, when it does get there, it is like raw flesh to a dog, harder of digestion than cooked flesh, and grass in its raw state is harder of digestion than good seasoned hay; witness the ass that had been twenty hours from grass, and when killed that grass was not converted into chyme; for if it had undergone its complete chymification, it would have passed the pylorus, without being pressed forward to make room for more food being taken on the stomach, but it was found on the stomach, and had the appearance of chopped spinage.[1]

"A horse was also fed," says Mr. Blaine, "with the same quantity of oats after a two days' fast, and six hours and a half afterwards was destroyed. Most of the corn was lodged in the fundus; its colour was unchanged, though it was converted into a soft, humid mass, consisting of husks, kernels, and parts of kernels, from which could easily be pressed a yellow liquor, into which the undissolved kernels were convertible by a little trituration between the fingers." Now, this was not being completely chymified. He also, in the same page, quotes the case before-mentioned, of the ass; with grass remaining on her stomach, under the appearance of chopped spinage, which must have been at least twenty hours after the grass was eaten. In the following page, 260, he has this remark on the horse:—"It is self-evident, therefore, that if the horse have a small stomach, and yet eat so *largely*, and, as is well known, so *frequently*, he must digest all bulky food, as grass, with equal *rapidity*." Again he says, "the mass, in its progress towards the pylorus, becomes completely saturated with the true gastric mucus, and the work of *chymification* being FINISHED, the chyme is protruded through the pyloric outlet, to be further acted on for *perfect chylification in the intestines*." And

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[1] Mr. Blaine, speaking of the smallness of the horse's stomach, says, "It is, however, capable of such distension, as to have been found with upwards of forty pounds of undigested hay in it; but this, it must be remarked, was a remarkable instance, as it has become ruptured from

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combined gascious and solid contents of much less apparent bulk." The forty pounds of undigested hay is so extremely inconsistent with the size and structure of the stomach as to render it quite incredible; while its being ruptured with a much less bulk is quite in character with what he afterwards said, namely, that "the stomach of a horse is less liable to distressing distension than that of most animals." Yet its being ruptured is extraordinary, when the food, as Mr. Percival shows (whether in a state of chyme or otherwise is immaterial) passes off to make room for more food being taken on the stomach, unless it is by the small intestines being clogged with undigested food, which tends further to prove the slowness of the digestive process in that animal. If digestion is not slow in a horse, I should be glad to know why vegetable purgative medicine, such as aloes, is so much longer before it operates in a horse than it does in a man? Mr. Blaine attempts to account for this in a different way, but with all due deference, I conceive not satisfactorily. Vegetable purgatives being of the nature of food, digests, and enters the blood; the great quantity found necessary to be given to a horse, may, in some measure, be owing to his great bulk; but the quantity being apportioned to his bulk, and yet being so long before it operates, is clearly owing to his natural slowness of digestion, and the mass of matter it has to penetrate through; if not so, why is it when a change of food of a different colour is given, as grass after hay, that it is so long before you can perceive any change of colour in what comes from him?

in page 259, he says, "It is thus that a mass of vegetable matter, of the nature of hay, grass, or other succulent herbage, passes the assimilating process within the stomach, which *readily* and *quickly* reduces it into a semi-pultaceous mass, called *chyme*, after which it is hurried onward to have the chylous animalization completed within the intestines."

Now, but for the two last quotations, "of the chymification being *finished in the stomach*," I was induced, from the obvious inconsistency of the *activity* of the gastric process in the horse of Mr. Percival, and the *rapidity* of digestion in the horse of Mr. Blaine, with the actual experiments on the ass and the horse, wherein the farina of oats is not converted into chyme in six hours, nor the grass in twenty hours; from this obvious inconsistency I was inclined to consider their expression of "chyme in the stomach," as a mere discrepancy of technical phraseology of the term, and that they merely meant that it was, while in the stomach, in a *chymifying state.*

Such, however, appears, by those quotations, not to have been their meaning; for the chymification is said to be *finished in the stomach*, the chyme protruded through the outlet, to be further acted on for the perfect *chylification in the intestines.*

Now, I should like to know how they reconcile this *ready*, *quick*, *rapid*, and *complete* chymification in the stomach, with the two instances of actual experiment they themselves state, of the horse and the ass, wherein six hours had elapsed for the farina of oats, and twenty hours for the grass, and that work not completed, and which would have been fully completed for the oats in a third or a fourth part of the time, in a dog or a man. This, too, under circumstances where the whole energy of the stomach was directed to that particular work, uninterrupted by bodily exertion on the one hand, or more food coming into the stomach, on the other? If it be not converted fully into chyme in that space of time under those circumstances, how can it be *at all* converted into chyme in the *stomach*, with that stomach so small, and the horse continue to eat for those six hours, which he will do with food before him, during which he will eat a quantity sufficient to fill his stomach many times over. It is morally impossible to maintain such a doctrine.

Mr. White, though he considers digestion in the horse to be *principally performed* in the *stomach*, yet admits it to be carried on in the intestines also; but Magendie says, it is *principally* performed in the *intestines;* and I conceive, that the evidence offered by Messrs. Percival and Blaine themselves, is entirely sufficient absolutely to prove beyond a doubt, that what Magendie says, is the actual and true state of the case. Now, I apprehend, that the most common error among veterinarians, and that a very great and important one, from which many wrong theoretical deductions may be, or are formed in the treatment of horses under various diseases, instead of their considering the digestive process in that animal to be active and rapid, is, on the contrary, in not considering it to be *peculiarly slow and inactive,* compared with other living bodies liable to severe and violent exertion; the dog and the man for instance.

On the subject of the pylorus, Magendie says, p. 252, "The pylorus has been made to play a very important part in the passage of chyme from the stomach to the intestine. It judges, they say, of the chymification of the food; it opens to those kinds that have the required qualities, and shuts against those that have not. However, as we daily observe substances not digestible traverse it easily, such as stones of cherries, it is added, that becoming accustomed to a substance not chymified, which presents itself repeatedly, it at last opens a passage. These considerations, consecrated in a certain degree by the word *pylorus, a porter,* may please the fancy, but they are purely hypothetical. The pylorus enjoys so few of the imaginary attributes with which it has been clothed, that in certain animals the intestinal extremity of the stomach is never shut. This is the case with the horse; his pylorus is always widely open, and therefore the aliments rest but a short while in that viscus, and become only slightly changed in it. The true pylorus of the horse is at the cardiac orifice of the stomach; its use appears to be, to oppose itself to the return of aliments and drink into the œsophagus. If we pay no attention to the free communication of the stomach with the intestines, we shall never comprehend how the stomach of the horse, which in its greatest extension can contain scarcely twenty-five pints of liquid; a bottle of hay, and fifty pints of water for instance. The phenomenon of digestion in the horse appears to take place at the same time in the whole intestinal canal, and even in the large intestine. This last circumstance merits particular attention, and a special investigation."

Mr. Blaine admits, p. 258, that the quality of the gastric fluid varies in different animals; and he also admits a structural peculiarity, or as he elsewhere terms it, "a specialty of structure of the stomach of a horse," regarding distension or contraction; and that his stomach is wholly removed from any pressure by the abdominal muscles; all which are auxiliaries in digestion, but of which the horse by nature is partially deprived. Mr. White confirms their stomach and intestines having very strong muscular coats; and physiologists allow that the energy of the gastric juice is in an inverse ratio to the strength of the muscular coats of the stomach; these considerations, supported as they are by the result of experiments mentioned, with our own practical observations of effects in various ways, will warrant the conclusion, both by theory and practical experience, that the digestive process in the horse is peculiarly slow and inactive; and it appears to me very extraordinary that veterinarians should consider it otherwise.

I believe the fact to be, that the food in the stomach of a horse is merely saturated with the digestive juices *in degree;* that it passing off in that state through the pylorus, is regulated, in point of time, by what quantity more is taken on the stomach in succession after it, and not dependant, or very little so, on its greater or less progress in chymification; and that if no more food be taken in succession, the last taken in will remain n a torpid state for some time. Horses that are found dead, apparently from want of food, or those killed for dog meat, or being useless from their reduced or decrepid state, are found when opened to have food on their stomachs very little chymified, when there is every reason to suppose that they have eaten no food for a long time, and their small intestines are nearly empty. From this being so commonly found to be the case, those who are in the habit of killing horses for dog meat, have a quaint remark, that "they have always food in their stomachs when they are clammed to death."

It follows from these facts, that the horse's stomach is merely a sort of receiver of the food, and saturating it with the digestive juices, prepares it for undergoing its further progress of digestion in its passage through the small intestines, where both chymification (if any such distinctly take place) chylification, separation of the alimentary from the excrementary part, and absorption of the aliment into the blood and system, are simultaneous, and progressively completed. There is undoubtedly a copious supply of gastric juice both in the stomach and small intestines of a horse; but that such juice has not that degree of energy or power which the gastric juice of other animals possesses, there is every reason to conclude. It may further be doubted, whether chyme, as a distinct mass, is ever completely formed in a horse; but that the food, after being saturated in the stomach with the digestive juices, undergoes a regular process until the separation of the alimentary from the excrementary parts takes place, when chyle is formed from the alimentary part; it is evident chyme is seldom if ever formed in the stomach, and the saturated mass meets with the bile from the liver and the pancreatic juice, very soon after passing the pylorus, under the influence of which chylification commences, though chymification has not terminated, or has made but little progress towards its complete formation; but digestion goes slowly and progressively on during the passage of the aliment through the small intestines, until the aliment is separated from the excrement, by its union with the bile from the liver and the pancreatic juice, aided by the threads that cross the interior of the small intestines, which divide, open, and separate the mass passing in its rotary motion through them, when the aliment is progressively liberated from the excrement, and converted into the fluid (chyle) in which state it is taken up by the absorbents, and in the same order conveyed into the system.[1]

It is not to my purpose to enter into the question in all its ramifications of the immediate or more proximate causes of broken wind in horses, so much as the primary or pre-disposing cause of his peculiar liability to become so more than other animals. A complete remedy, when once it has taken place, is impossible, though the ill effects may admit of palliatives; but the real cause of their peculiar liability to it being once established, may lead to preventatives, which are allowed on all hands to be better than remedies.

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[1] Since writing the above, I find myself supported in the idea of the horse's stomach being merely a sort of receiver for the food to be saturated in the digestive juices, by Mr. Dick, in the Veterinarian, December, 1832, page 676, in which he says, "In the horse we find a portion of the stomach lined by an insensible coat, forming a kind of *pouch* for the masticated food to steep in, to be prepared to pass on to the portion where the digestion is more especially carried on."

Mr. Blaine says, " A certain form of body is unquestionably favourable to its production, and it is from this circumstance that it proves hereditary. The narrow confined chest, and the pendant belly, which mark low bred horses and gross feeders, all of which are observed to be peculiarly liable to it, are pre-disponents, by confining the ordinate action of the lungs, and affording no reserve for the inordinate."

Such a horse, if put to violent and sudden exertion, may readily be supposed to experience a structural derangement, or rupture of the air cells of his lungs; and if you add to this, that his food was of a bad or inferior quality, more difficult of digestion, rendering digestion more slow, " when slow as in the best it is," it would be strange if some organic disarrangement did not take place when he must have an accumulation of indurated fæces in his stomach and bowels, which would of course greatly distress his respiration, and in the violent effort nature would make to relieve itself, this rupture takes place.

The remarks of Mr. Harrison, veterinary surgeon, of Lancaster, in the Veterinarian, page 355, July, 1833, on the intention of the Creator, and the effects of bad food, are appropriate. He says, " He formed the mountain and the valley, the flat and uneven land, without, I think, ever designing that the cattle should be confined to one particular place; and to each of these situations he has appropriated a variety in soil and herbage; although, owing to the talents and ingenuity of many eminent men, the soils, as well as their produce, have been improved by the various agricultural processes; yet a difference in situation, soil, and produce, must and will exist to the very end of time; for not all the tact and ingenuity of man can render all soils capable of producing grasses of an uniform quality, or possessing the same nutritive properties, or that can be acted upon in the same degree by the digestive powers.

"Reasoning thus, we may with perfect ease account why cattle removed from their native situation, whether it be from the mountain to the valley, or *vice versâ*, to the produce of which their corporeal wants have not been habituated, will be pre-disposed to disordered digestion by such removal, which pre-disposition will be excited into action by the food containing a greater or less quantity of stimulus than that to which they had for a length of time been accustomed.[1] Cattle subject to cold weather, and bad food during winter, instead of a plentiful supply of good hay, where grass is not in sufficiency, with warm sheds, &c. &c., the owners would not have so many losses in spring and summer, not so many cases of diarrhœas, coughs, &c., which only awaited an exciting cause, viz., fresh grass, &c. &c., to become more perfectly developed in all animals whose organic powers have not been able to withstand the shocks of absurd deprivation and severity."

Mr. Blaine says, "It is not by any means uncommon to meet with broken winded horses whose lungs after death are not structurally deranged; but it must be acknowledged, that it is seldom they are seen thus free from diseased appearance; they are hepatized, or conjested, sometimes tubercular. If likewise a mechanical rupture of the air cells were the universal cause of broken wind, it must always be sudden, or nearly so; whereas it gives some years' warning cough, or thick winded wheeze so well known." Now this cough or wheeze may be brought on by a cold, and itself promote indigestion, where the powers of digestion are naturally slow, even if the food is of a good quality; or that cough or wheeze may be brought on by bad food, and more likely to be so where the digestive process is naturally inactive; the rupture may not unlikely take place suddenly at last, when we consider that the lungs have been gradually debilitating during these years Mr. Blaine speaks of, the inactivity and weakness of digestion, getting gradually worse during the time.

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[1] This change of food will cause an increased rapidity of digestion, which Mr. Harrison terms a disordered digestion; but which nevertheless may terminate in the effects he describes.

Again, he says, "Subjecting horses to a long continued course of feeding on dry food, as chaff, bran, barley meal, &c. &c., brings it on; working in mills, where much dust is necessarily inhaled; it is seldom the immediate consequence of pneumonia, but frequently it results from those states of disordered respiration which succeed to it, as thick wind, chronic cough, &c.; we see that it gradually steals on a horse, occupying months, and even years, in a slight occasional cough, which ripening into a state of slightly impeded respiration on exertion, at last ends in broken wind; we see it follow one hard gallop; and we can leave a horse well one day, and find him broken winded the next."

I have briefly quoted the variety and contrariety of cases mentioned by Mr. Blaine, of horses becoming broken winded, and I cannot perceive any one of them to which this peculiarity of structure does not closely apply, as rendering the horse peculiarly liable to broken wind, by indigestion producing all those effects which he mentions as finally ending in it. Indigestion, whether originating in bad food, a cold, or other causes, is the general forerunner of diseased lungs; and it evidently is the lungs being diseased, whether the air cells are ruptured or not, which constitutes bad or broken wind. Such may possibly happen to any animal, although it is well known to happen more frequently to the horse than to any other animal. I have heard one case of a dog being broken winded; some few of cows, which never thrive or do good after, and the owners of all I have heard speak of such cases in cows, attribute the disease to some very bad hay they happened to have some particular time previous. The so much more frequent occurrence of it to the horse than to the cow is evidently from the more weak and slow process of digestion in him than in the other. Violent exertion alone does not cause it, or it would occur to horses much more frequently than it does. See the violent exertion of the race horse, and the long continued and violent exertion of the hunter, taking his *rasping* leaps one after another, during his other violent exertion of galloping, enough, if exertion alone caused it, to rupture his air cells in one fox chase; yet they go broken winded much more seldom than hacks or cart horses;

simply because they have the best and most choice hay and corn, while other sorts of horses are more subject to have both of an inferior quality.

Broken wind does not always occur to horses under circumstances of violent bodily exertion; it is known to happen to them out at grass, as before observed; in which case it may be, and probably is, owing to violent *organic* exertion. A horse, in a foul state of body, turned out to grass, eats greedily of it: in doing which, he is a long time in disencumbering his stomach and intestines of their accumulated, and probably indurated load; his lungs are distressed to a great degree without bodily exertion, and nature makes an effort to relieve itself, by which effort the lungs may or may not be ruptured, according as the intestines are more or less loaded with indurated matter.

A cow and a horse may have been eating for weeks or months from the same stack of hay, one as free from labour as the other, and the hay neither of very good nor of very bad quality, and both turned to grass on the same day; yet what inferiority existed in the hay will be much more visible in the horse's appearance than in that of the cow; she has plenty of *stomach room*, and her stomach is not disordered to such a degree as the horse's is; every one experienced in horseflesh is aware of the very great and evident difference it makes in the condition of a horse between eating for a length of time very good hay, or hay only moderately inferior; Nimrod has said much on that subject, and with great truth; a small degree of difference in the quality of hay, is perceptible in a horse in a very few days, much more so than in other cattle that feed on it; simply from the greater want of energy in his digestive organs or agency, from his peculiarity of structure.

It will be admitted, that if a horse becomes disordered in any way, from whatever cause, or however trifling a degree at the first, he is more delicate under it, and more difficult to cure, than most other animals; and I would beg to ask, what rational cause can be assigned for it, more obvious, or more within the bounds of probability, than his naturally peculiar slow and weak powers of digestion? The less active and powerful it naturally is, the greater the injurious effect, and the more difficult it is to be overcome by the efforts of nature, is any injury done to the system by whatever means. The gastric juice is allowed to be the principal and most powerful agent of digestion; its energy is in an inverse ratio to the strength of the muscular coats of the stomach; the muscular coats of the horse's stomach are probably stronger than those of other animals; therefore in the horse, the first and most powerful agent of digestion possesses less energy than it does in other animals, and consequently is weaker in its effects upon the food. Pressure and irritation are secondary agents of digestion; of these the horse is partially deprived, his stomach being less contractile and removed from pressure by the abdominal muscles, on the one hand, and being small and not expansive so as to come in close contact with the action of the lungs, has consequently less aid in digestion from the required irritation on the other hand, renders the secondary agents of digestion less efficient in him than in other animals; he is thus deficient in both first and secondary agents of digestion, without any countervailing properties in his system to promote or constitute an equivalent for those deficiencies.

I have thus ventured my own opinion on the primary cause of broken wind, to which horses are so peculiarly liable; it is open to whatever criticism is thought worthy to be bestowed upon it, by those who are, and who ought to be, more competent than myself to determine whether I am right or wrong. If I have thrown out any hints which may prove beneficial to that most noble of all animals, the horse, I shall be perfectly satisfied, even should I prove to be mistaken; its being my candid and honest opinion, and being expressed with no other view than to prove beneficial to him, will be my own recompense. At all events, it will probably promote discussion, and cause further inquiry into the matter, so that good may result from it one way or the other. I must now return to the inquiry into the comparative organization of the digestive faculties of the horse, the dog, and the man.

We may conclude, that a hunter has some of his over-night's food, together with his morning's corn remaining in his stomach and intestines, when he leaves his stable, which continues gradually to support his strength during the labour of the day. We have the ass with six hours' rest after eating, and the farina of oats not wholly converted into chyme, while from one to two hours, according to Magendie, is sufficient time for wheaten bread in the stomach of a dog. In this comparison it must be admitted, that bread having undergone the process of fermentation and of baking, is sooner digested than the farina in its raw state; but that consideration is by no means equal to the difference between one or two hours in one animal, and six or seven in the other; any aliment that is fermentative, which is the case with the farina of oats, offers but little resistance to the gastric juice, and is soon digested, therefore the ass being upwards of six hours in digesting it in one state, and the dog only one or two hours in the other state, is quite sufficient to prove a much greater rapidity of digestion in the dog than in the ass or horse.

The difference in the organization of the horse from that of the dog appears necessary to support his strength during the labour he is destined for; his stomach is small, but organized by nature for digestion of his food being principally performed in his intestines, they being large, and further removed than his stomach from obstructing the action of his lungs, in order that he may take in a sufficient quantity of aliment, and that aliment progressively nourish him, and sustain his strength during the many hours he is at work and absent from his manger, which corresponds with the time required for his eating a sufficiency of food.

Digestion is more rapid in the man than in the dog; they both eat the same food, with the exception of bone; from digestion of the former being more active, and a smaller quantity filling his stomach, which is sooner digested than a larger quantity, he requires to eat a full meal oftener in the twenty-four hours than a dog requires to eat. We have, therefore, that unerring guide, nature, before our eyes, in feeding the greyhound when training him for the course; the propensity to eat much or little in man or beast is controlled by the capacity of the respective stomachs; the brute animal seeks instinctively that kind of food most adapted to his nature, and nature has beautifully adapted the organization of his stomach and his powers of digestion according to the time required for him to eat it, on the one hand, and on the other adapted him to the time required to be at work in the interim between meals.

Mr. Percival appears not to have considered the continuity of change taking place in the changeable parts of the animal solids and fluids, when he inferred that "the horse's stomach was proportionally small, in order to render him more effective as an animal of speed and burthen, the gastric process of digestion being very active, and chyme continually flowing out, in order to make room for the aliment he continues to take in;" for on the contrary, digestion in him is slow, and performed in the intestines, the aliment progressively nourishing his frame and supporting his strength, which is the real cause of his being rendered more effective as an animal of speed and burthen; for if it were so quickly converted into chyme as he seems to consider it, there would be nothing to eke out his strength for the great length of time he is at work and absent from his manger, as it would all have passed off into the system long before, and for want of fresh support coming into the organs of the body, weakness would ensue.

The same mistaken idea is conceived with those who consider it absolutely necessary for a greyhound to be empty when he runs, as in such case he must be getting weaker and weaker throughout the day, and his stomach being exhausted would add to the weakness experienced by the body.[1] The dog eats, or should eat, bread or pudding of one degree of digestibility; vegetables of different degrees, but easier digested than flesh; the latter also possessing different degrees of digestibility, but the hardest of its digestion is completed sooner than bone; they all require a longer time for digestion, absorption, and by its circulation thrown over the different parts of the body, creating new flesh, and renewing the strength in the dog more than in the man. The dog eats, in a short time, his full meal of vegetable substances and of flesh; and if you allow him to do so to satiety, he will take a bone to his bed and eat it at leisure; if, in some hours after, you offer him both flesh and bone, he will perhaps eat a little of the flesh, but the bone is what he retires with, which is the longest in digestion, but which, from that very cause, he instinctively eats, as it ekes out his strength a longer time than any other food. Thus nature dictates to him food, and provides him with a powerful masseter muscle in his jaw to enable him to crush it, which will keep his stomach longer from being exhausted for want of more food, than a man will be from the food he eats, and his power of digesting it.

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[1] The muscular power of the body is affected by the state of the stomach; if the stomach is either exhausted for want of food, or oppressed with so much of it as to be fully occupied in digesting it, the efforts of the heart are directed to its assistance, concentrating the bodily energy towards it; and *vice versâ*, if the stomach is in a state of repose, the muscular power of the body is at liberty to be wholly directed to other necessary purposes.

By that refinement of feeding the dog two half meals in a day that he may not distend his stomach, and make him uncomfortable, you are thwarting nature, disappointing his appetite, and by making him restless, losing part of the benefit which he ought to derive from his refreshment; besides which, if he has only half a meal, digestion goes on more rapidly than when he takes a full meal, though the food may be of the same nature; his appetite is not so thoroughly appeased, which will more endanger his rest being interrupted in the night by craving for more food; and it also disarranges the natural organization. There is more time required than is supposed by many for the whole food to undergo the necessary changes to lose the qualities it had when eaten, and be assimilated to part of the dog that eats it; by adding fresh food before the former is gone off, you impose on nature, or on the stomach, the task of carrying on two different operations at the same time, beginning the digestion of fresh food while nature is still busied in completing that of the last. This latter position is by some carried farther than the principle on which they advance will warrant, as even to the human species eating a small biscuit is by them interdicted for some time after eating a meal, which is a refinement in a greater extreme to two meals instead of one in a day; nevertheless, eating in quantity soon after having done the same, is objectionable in theory and practice also, with both men and dogs; in a horse the position is quite different, as his organization is calculated for eating a length of time, or fresh food in quick succession, as he cannot eat enough in a short time to sustain his strength; men are a much shorter time in eating sufficient than a horse, dogs a shorter time than men; the objection to eating in quantity, and in a short time repeating it, applies more to the dog than to other animals, and more to the greyhound in training than to other dogs; you have not time in the winter to give two meals in a day, of proper food, without interfering with his exercise, or his exercise interfering with the digestion of his food; therefore with him, by twice feeding in a day, you are imposing this double task on nature of carrying on two different operations at one time, at the time you want to assist nature in the greatest degree possible.

A full meal of proper food does not endanger the dog losing his rest in the night, but allows more time in the day, having previously had his quantum of exercise, for his food to digest in its regular and natural course; a full meal is the most congenial to his nature, to the organization, and (if of a variety of aliment of different degrees of digestibility,) is the most strengthening to his frame.

With respect to Cornaro living to the age of one hundred and five years on a regular regimen of only fourteen ounces of food daily, I can readily imagine, when you have found out the capacity and power of a man's stomach, or of any animal's, that a uniform quantity of food suitable to that capacity, will best conduce to old age, by not overstretching those powers, but keeping them "from spending till time of necessity." But in training greyhounds we are not training them to run a race for old age. In training or dieting a man to live long, you neither stretch the powers of his stomach with its full quantum of food, nor the powers of his body by great exertion; one must be coeval with the other; and by the same rule, if you put him to great exertion, you must give him greater nourishment to support his bodily strength, or he will soon become weaker.

Mr. Lascelles, who considers a fortnight quite sufficient to get a greyhound in condition, says, "that you cannot safely do that more than three times during a season." I suppose he means, you cannot safely do that oftener, without an injurious wearing away of the constitutions of such fine shaped animals, of which such fine superiority of speed and energy is required; and I am quite satisfied that he is right in principle, and not sure that you can safely carry it to a greater extent in practice, except with very strong constitutioned dogs. Some difference may be allowed in that respect; when they *are* wanted, their powers are required to be on the full stretch; and it will readily be conceded, if that great energy and exertion are exercised with moderation each season, they will be able to run well for a greater number of seasons, retain the acme of their speed, and their inclination to exert it to the utmost, than if those powers were exerted each season much more frequently. But to stint a man to moderation in quantity of food most conducive to old age, and forcing a dog to tip-top condition to course hares and win a cup, are two very different things, bearing no analogy to each other.

The utility of allowing the same weight of food for all men alike, be their weight or stature ever so different, as recommended by the celebrated Abernethy to men training for the prize ring, may be doubted as being the best possible system. This might possibly be put to the test with a more conclusive and satisfactory result with two greyhounds of equal speed, but not of the same weight or size, than with men, by adopting something like the plan hereafter recommended to be pursued to ascertain at the commencement of the season the quantity of flesh each dog runs best upon. When that is ascertained, I can readily concede the point, that a uniform quantity during his time of training is better than an irregular quantity, and given to him uniformly at the same hour each day, for habit influences their craving sooner or later for food, and consequently influences their resting well or ill during the night.

A uniform quantity of food, consisting of a proper proportion of animal and vegetable substances, is the greatest desideratum; a full meal of variety of aliment, without fat, having previously had *quantum sufficit* of exercise, well cleaned and brushed over, put into a clean, warm kennel, the energy of their stomachs restored by a small quantity of warm broth, a little thickened, and rest an hour or two before feeding, and three hours afterwards without liquids, after which about half an hour of walking exercise and fresh air, emptying themselves, and their kennel cleaned from any fresh filth they have made, the door set open meanwhile to sweeten the kennel, themselves brushed over again when brought in, and if you wish to force them further with nutriment, the yolk of an egg or two for each dog, and for their better rest during the night by not craving for more food, a few bones, say two or three for each, from a neck of mutton for instance. This system followed for a week, or only four or five days before coursing, the dogs being previously in good health, and plenty of gentle exercise, with a good portion of muscular flesh on their bones, and with equal blood, shape and speed, you will not easily be beaten in your courses. For if this system, in accordance with the nature and organization of the animal, and administered by skilful hands, will not beat, either for a short course or long one, or for one or two courses or more in a day, all the artificial compounds, aniseed, isinglass, or any other unnatural food which all the fancy-mongers in England can invent, with their two hours' galloping exercise to boot, and all their additional trouble and expense, and continued week after week, and month after month, till the dogs are become "stale, flat, and unprofitable;" then, and not till then, will I give up my judgment in dog flesh.

Grass and corn for the horse were neither of them originally the invention of man; they were among the fruits of the earth ordained by a bountiful Providence for the sustenance of man and beast; the latter, in the first instance, eat them green in the field, because he found it readily for them, and the season dried and cured it for their winter use, till the ingenuity of the former, instructed by nature's periodical re-production of them, learned to till the earth, and sow the seed for that purpose; and in storing it for use, to serve until a fresh supply was obtained from the earth, he found it more beneficial, after being dry and seasoned, by which the inferior particles are liberated and dispersed, in supporting the strength of the animal under his labour, than when eaten in its green and raw state; and in the course of time found the necessity of controlling the quantity eaten for particular purposes, and directing the proportion of each sort. Precisely on the same principle is it that the greyhound is controlled in the quantity of flesh different from what his own inclination would prompt him to eat, and instead of giving that flesh in its raw state, depriving it of its rawness and grossness of impurities, by culinary process, as the horse having seasoned hay and corn instead of grass when he is wanted for hard work, but which if left to his own guidance he would eat in its green and raw state, though good seasoned sweet hay was before him; but of that good seasoned hay and corn, they allow him as much as he will eat with a good appetite, when in training for the greatest exertion he can be put to perform.[1] To give a dog only half what he will eat at a time, or to give him that food which is so excessively light, and easy of digestion of artificial compounds and jellies, instead of his more natural food, when nature has provided him with a stomach capable of digesting bone itself, is as anomalous as feeding a horse with fermented bread and fine old cheese, instead of hay and corn.

The wisdom and goodness of Providence is eminently manifest in the organization of the animal system, and its beautiful adaptation in the several species to their peculiar uses for the benefit of mankind, as is evident in the comparison of the different organization in the dog and the horse. The machinery is so constructed as to give support to the two animals, and nourish them, according as their powers are brought into action, corresponding with the length of time each requires to eat and digest his food, and the time required for the labour of each, which varies accordingly. It may be compared to a machine, to which He alone gives life, by furnishing it with a circulating fluid, called blood; but independent of giving it life, that beautiful organization and arrangement of its constituent parts for the purpose intended, all aiming at the same end, but by a different ratio of means, is far above all human intellect to invent, and cannot fail on reflection to inspire a sentiment of truly religious gratitude and thankfulness to a bountiful Creator. The infidel scoffer and unbeliever in a divine Creator of all things, will be unable, on this point alone, to establish an hypothesis on which to maintain his doctrine of mortal supremacy, in which he so stubbornly and stiff-neckedly adheres in his fallacious notions, as if man had been the artificer of everything; the reflection reminds me of the story of Plato, when walking with a friend, and observing a fine looking large mansion, "Who built that house?" said his friend; "God," said Plato.

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[1] Mr. White, in his Farriery, appears to consider grass as the *only* natural food for a horse. If so, I should like to know *two things only*, amongst many others that might be named; first, as corn is the product of the earth by the bounty of Providence, and not originally by the in-

"How could God build a house?" returned his friend; "Why," said Plato, "Who built this beautiful universe, and how did he build it?"

To deny the Omnipresence of a munificent and bountiful Providence in the formation of this diversity and beautiful adaptation of structure of all his creatures to the several uses for which their powers were, by his ordination, directed, is impious, irreverent, and sacrilegious to the Divine Being; and to suppose that the combined ingenuity of all mankind, even after the seven thousand years' experience and knowledge of that beautiful mechanism can produce its like in form or feature; or that the same Being who created and thus beautifully adapted all their powers does not retain the power to punish those whom he has endowed with reasoning intellect for their disobedience to his ordination in their various misdeeds, *when* and *how*, in his infinite wisdom, he thinks meet, but which to us is inscrutable, is in the highest degree at once impious, absurd, and ridiculous.

These infidel unbelievers of the Divine Omnipresence are sometimes taught, by those they attempt themselves to teach, by simple innocence, that their doctrine is erroneous. The atheist who had his own child on his knee, teaching him that *nature* was the source from which everything was derived, being asked by the child, when in his innocent playfulness, he placed his finger on his father's nose, "Who made that?" answered, "Nature," "Well, but then," said the child, "who made nature?" The father was set fast for an answer. Nor can the atheists bring forward any sound reason in

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genuity of man; and allowing wheat, barley, oats, and some other grain to be for the food and use of mankind, what was the purpose of the Creator causing, what are called horse beans, to spring up with other grain, as I know not much other use they are put to than feeding horses? Secondly, what was the use of nature providing the horse's teeth, called grinders, with rough ends to meet in the upper and lower jaws? Surely not to grind green grass; the smooth ends, like those of dogs, would be sufficient for grass; though the horse has a masseter muscle attached to his nether jaw, it is by no means so powerful a muscle comparatively as that with which the dog is furnished to enable him to crush bone.

answer to many such pithy questions which may be asked of them, and their perseverance in their erroneous notions in the face of such unanswerable questions in support of their doctrine cannot be attributed otherwise than to the obduracy of their minds *steeled* against conviction.

Before we can allow the atheist the superior penetration which he assumes over those who admit the supremacy of a divine Creator and Artificer in the ordination of nature's works, he must inform us by what means, or mechanical agency, are derived (otherwise than by the will of the divine Creator) our faculty of *thought*, of reflection, recollection, calculation, and the general powers of reasoning with which we are endowed, and made superior beings over the brute species, by which we are enabled to control and govern them. If he cannot inform us on that subject, he must be content to be considered as possessing less, instead of more penetration than the good Christian. Neither can the Puritan support his supercilious abhorrence, and pretended sinfulness of witnessing and admiring the beauties and excellencies of the several performances of God's creatures, "to see how God in all his creatures, works," in the capacities for which they are by Him especially ordained, when they reflect how admirably the organic powers of each are adapted to the labour they respectively have to perform for the use and benefit of man.

"Let christianity," as before quoted from the translator of Arrian, "transfuse its lenient spirit into all our sports, and instead of the amphitheatrical entertainments and barbarian amusements of infidels, let us have such as are congenial to the humanity of christians. Let us be the champions of rational recreation, not of brutal gratifications—the friends of man, and not unnecessarily the enemies of inferior animals; spectators in our temperate and innocent diversions of the innate faculties and prowess for the seizure of the destined animals of the chase, and witnesses of the curious search or conquest of one beast over another, pursued by a natural instinct of enmity."

"Know that such
Transporting pleasures were by Heaven ordain'd
Wisdom's relief, and virtue's great reward."—*Somerville.*

Neither is the study by mankind, (and by the youthful part in particular) of the organization of the various animals, and of the best mode of feeding them, devoid of useful instruction, and inducement to practise it, for the preservation of their own health, by a control over their own appetite, and inclination for indulging it. A young man of hale constitution, full of healthy juices, which produce high spirits, animation, and perhaps volatility of mind, disregards the sober admonition offered for the benefit of his own health, disdaining to notice it; as was quaintly remarked of Solomon's advice, when he said, that "they who get married, do well; but they that live singly do better;" to which it was rejoined, that "You must remember Solomon was an old man when he said so." So is a healthy young man more disregardful of his future health and welfare, than when he has experienced the consequence of such neglect; but when fired with emulation to see his favourite dogs or horses excel his contemporaries in sport, he is drawn to an anxious inquiry how to manage them best for that purpose, which instruction insidiously steals into his conviction of the analogy to his own state, and the necessity of regulating his own eating and drinking, and otherwise controlling his inclinations according to it, which is more strongly impressed on his mind, than if directly offered to him for that purpose: for instance, there is not one stronger or more useful feature in feeding dogs, or more necessary to be attended to, and to study the philosophical cause and effect, nor yet more clear and convincing, both in theory and practice, than that of not giving liquids in quantity at the same time, as eating heartily of solid food, or soon after; nor is there anything in the habit of men more likely to be the forerunner, in its effects, of a variety of evils, than in drinking at that time, nor is there anything more common in practice; and it will be found by the theory on the subject, and confirmed by practice, that the more you drink at that time, the more you require to drink afterwards, and the most conducive to that baneful effect, drunkenness; the stomach distended with liquids, those liquids mix with the digestive juices, and weaken their power; the watery part of those liquids soon passing off, leaves the solid food to be digested when the stomach is in a state of debility, thereby causing thirst; you gratify that thirsty sensation by drinking more, and continuing to repeat it, thus carrying on the evil effects until you become intoxicated, or or until you approximate towards it, which leads to further excesses to an indefinite degree; meanwhile, your food does not undergo its regular and natural course of digestion, and does you much less real good than it would have done without those liquids.

But enough of this; I must, in sporting language, "Hark back;" the reflection by its analogy forced itself on my mind, and has led me into a digression from the original subject.

Arrian's remarks on the kenneling of greyhounds are worthy of attention, which, though at so distant a day, are not very dissimilar to the method pursued by some modern coursers. He says, p. 95, "Nothing can be worse than for dogs to sleep with each other, and more especially so, if they touch one another in bed. For as all cutaneous irritation is removed by a man sleeping with them, so, when *they* sleep together, they generate every sort of foulness of skin, by warmth and close contact, and are generally full of mange; to which cause must be referred the very offensive and pungent stench on entering a kennel where many hounds are kept together."[1]

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[1] A kennel ought at all times to be well ventilated; for, supposing it is kept sweet and clean as possible by frequent washing and cleaning of the floor, yet where there are many dogs together, the atmospheric air is mixed with the air they expire, and is not so healthy for them to re-inspire as the pure atmospheric air. Magendie says, p. 387, "there escapes from the breast a great quantity of vapour, called *pulmonary transpiration;* besides its chemical composition is different from that of the inspired air; the proportion of azote is much the same, but that of oxygen and carbonic acid is quite different." Again, p. 393, he says, "Philosophers have not been satisfied with studying the effects of the respiration of atmospheric air. They have also wished to determine the effects of the respiration of other gases. Animals have been plunged into each of them, men have respired them either voluntarily or involuntarily, and it has been found that *atmospheric air alone is fit for respiration;* animals are *destroyed* with more or less rapidity by all the other gases; even oxygen, when pure, is destructive of life; and its mixture with azote, in different proportions from that of the air, always kills the animals that breathe it, sooner or later."

If, therefore, those kennels which are well and frequently cleansed from filth are unhealthy from the want of being well ventilated also, what must

His translator adds, "Mange is a chronic inflammation of the skin, constitutional in some dogs, infectious in others, and in a few I have known it hereditary. Ancient sportsmen had great dread of mange in their kennels. Gratius recommends the first dog affected with it to be destroyed, to prevent others catching so loathsome a disease." Venesection and purgation, as recommended by Savary, are most important auxiliaries to inunction, where you apply ointment."—See Blaine.

I have, on several occasions, known mange to be effectually cured by an ointment procured from Messrs. Jones and Tomkinson, chemists and druggists, Friar Gate, Derby, from whom I have also had powders for the worms for young whelps as

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those kennels be which are neither ventilated nor frequently washed clean? They must be *enough to poison a cat:* excuse me, my good friend, who will by that expression know to whose kennel I am in particular alluding; but I never enter your kennel either morning, noon, or evening, but I have great occasion for my snuff-box, and cannot even then bear to be in it long; the dogs are all loose in it, their owner being bigoted in prejudice against their being tied, and if you open the door only a little way to look at them, you have to keep them from rushing out for a little fresh air by a whip or stick; or if you have to go into the kennel, you are obliged to shut yourself in to keep them from running out; this want of their being fastened by a chain or strap is probably one cause why the kennel is not more frequently well cleaned and ventilated by the door being set open for the time; as to do so would give additional trouble in getting the dogs into the kennel again, besides the chance of their running away, or of laming themselves, or of other mischief, while the man is cleaning the kennel, and consequently not attending to them. The consequence of this want of cleanliness is an additional injury to the lungs, by an increased adulteration of the atmospheric air, caused by a number of dogs or horses being confined in an ill ventilated kennel or stable; the filth undergoes a greater or less degree of putrefactive fermentation, according as it lies a longer or shorter time before being cleaned out, the gaseous products from which are, light carbureted hydrogen, carbonic acid, and, when nitrogen (which is contained in urine) is present, ammonia. As this is without any counteracting effect from an increase of oxygen, being in the kennel only a long winter's night is injurious, without its remaining uncleaned the next day, or day after day; it should be cleaned out the last thing before shutting up for the night and well as puppies and aged dogs, two or three doses of which have, in every instance, effected a perfect cure of them.

De Langley's instructions to the kennel man are, "I will him lerne that once in a day he voyde the kennel, and make it clene and remove the straw, and put again fresh new straw, a great dele and ryght thykke, and their bed be made of tree a foot high fro' the erthe, &c. The scabbe cometh to him when the abiden in the kennel too long, or ellis her litter and couch is unclene kept, or else her strawe is not removed, and shortly the hound is unclene."—*Arrian Translated*, p. 96.

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the first thing in the morning; the floor should also be so laid, that the urine will run freely off.

It is well that habit exercises such powerful influence over nature, and Providence, in the organization of the animal frame, probably foresaw that there would be such *slovens* among mankind, therefore protected the lives of those animals under the control of man from being sacrificed so soon as they otherwise would be by such uncleanliness; for if the princely greyhounds in this kennel had not been, in a manner, case-hardened in their lungs, by being so accustomed to this abominable stench, so many of them would not have lived so long as they have, to say nothing of the pre-disposition it gives the puppies to receive the contagion of distemper from which such havoc has been made at times in this same kennel. But independent of distemper, I would beg to ask my friend how many greyhounds in his kennel have lived to a good old age, say ten or twelve years, which many do in other people's hands; or whether he has not lost many valuable ones at only a middle age? As he dearly loves to crack a joke on others, so may I retaliate one of the many he has cracked on my poor head; it may be doubted, whether the gases generated in this kennel do not affect the owner's *eyes;* as from this, and other mismanagement, he has for several years been very unsuccessful in his matches, and cannot *see* when his own dogs are beat, but immediately, on the decision being given against him, sends, in his own mind, the poor judge to the d—v—l as a blind fool, or a rogue, or both.

There is, however, another way in which Providence has protected his creatures against the uncleanliness of their keepers, of more importance than the adulteration of the atmospheric air, in preserving their lives, by habit having such influence over nature; for without the other protection, Arrian recommending a dog to sleep with a man in preference to sleeping with dogs, is a *refinement* of kennel management, not much in accordance with our present refined intellectual notions. Let them have plenty of good clean straw to lie upon, and with other necessary cleanliness, their touching each other in bed would not of itself produce mange. Nevertheless, I know a kennel of greyhounds that are frequently diseased with mange, and Arrian reminds me of a remark made upon their beds by an old courser, when writing to me on training, after he had paid a visit to that kennel. He says, "the time to commence training must be regulated according to the dog's summer treatment; if all kennels are like the kennel of a friend of your's I saw the latter part of last July, it is necessary that training should commence from that period; their beds reminded me of an expression an Irishman once made use of, that, 'if *one* feather were hard to lie upon, what must so many be?' I believe your friend is a farmer, therefore want of straw could not be an excuse. Well, what then? Why through neglect, good feeding very ill bestowed."

Arrian says, "Rubbing the whole body is of great service to a greyhound, no less than to the horse; for it is conducive to the firmness and strength of the limbs; renders his hair soft, and his skin shining,[1] and also cleanses it from all foulness, The back

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that influence of habit would not avail them so much as it does. Independent of the vapour and gases impregnating the air, there is the odour which arises from this filth; all odour is in particles; and the olfactory apparatus is described as a sort of sieve, a protection against the lungs being injured by all particles in the air, whether from dust or odours; to admit the air to the lungs, but stop the particles, which lodge in the nasal cavities, and the odoriferous particles strike on the olfactory nerve; this is the way that hunting dogs are sensible of scent; but more of this when we come to foxhounds, pointers, &c.; as I merely mention this to show that the poor dogs are more beholden to their Creator for their lives under these circumstances, than to many of their keepers.

[1] His translator says, "This is partially effected in modern days by body clothes. The clothing of greyhounds, as at present practised by coursers, is of more remote antiquity than the days of Michael Angelo Biondi; having its probable origin in the kennel of Xenophon, who describes, in the 6th chapter of his Cynegeticus, all the accoutrements of his hunting pack, &c."

and loins you should rub with your right hand, placing your left under the belly, lest the dog be forcibly pressed down upon his knees, and suffer injury. The sides should be rubbed with both hands at once, and the haunches quite down to the feet, and the shoulders in the same way. When the dog seems to have had enough of it, lay hold of his tail, and lift him up by it; and then having drawn it through your hand, let him go. As soon as he is at liberty, he will shake himself, and show that he is pleased with the operation.[1]

"It is of equal importance with any other, that greyhounds be confined during the day;[2] otherwise they will unavoidably become untractable, and whenever fastened with a collar, will be impatient under restraint, and whine, and gnaw the straps, so as even to require chains like malefactors. Besides, a hound that is at liberty must needs eat everything that falls in his way; and from running about during the day time, lose the acme of his speed. But

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[1] This is precisely the manner in which I have frequently seen Mr. Hoskins's greyhounds dressed over. They also show us the pleasure they feel, and instruct a watchful observer of their actions, of the necessity for rubbing and brushing them, as conducive to their cleanliness and comfort, as well as the benefit derived to their bodies, by their own instinctive actions when let out of kennel, without having been previously brushed over; if in a yard where there are hay-stacks or other kinds of stacks, they will generally rub one side along the whole length of the stack, and return rubbing the other side against it; then shake themselves, and scummer about for a time, after which, if straw lie in the yard, they will quietly lay themselves down upon it.

[2] Markham says, "Now for the kenneling of greyhounds, it is a right necessary action, and must be performed with all diligence; as it breeds in the dog lust, spirit, and nimbleness, prevents divers mischances, and keeps the powers from spending till time of necessity; and therefore you shall by no means suffer your dog to be out of the kennel but in the hours of feeding, walking, coursing, or when you have other necessary business to do about him." "But Arrian," says his translator, "means more than merely confinement within the walls of a kennel. The greyhounds are to be actually fastened with a collar and strap, or chain, &c.

A celebrated modern courser adheres very strictly to the system of restraint alternated with exercise, as recommended in this chapter, and appears to though generally at rest, they should still have their appointed time of walking out.

Four times a day, at least, take your dogs out of kennel to a level and open field, and there loose them from couples, to empty themselves, gallop, and run about. But if they have quite ceased coursing, let it be done more frequently.

How entirely different, or I may say, how diametrically opposed is this system recommended by Arrian, and sanctioned so far as not giving very strong exercise, by that practical and intelligent courser, old Gervase Markham, to the highly absurd system, practised by some of our modern coursers, of galloping greyhounds with horses for an hour or two, at as great speed as they can induce them to go. An amateur of the present day, whom I have long been convinced has carried this practice *very much too far*, writes me, that "he has never seen much advantage gained by what is termed *very severe training;* that is to say, galloping dogs at full speed for an hour or two, *each day;* but I have often seen dogs made as slow and as dull as post horses by it. If you take a dog's fire away, it is of no consequence by what process you deprive him of it, but it is clear to demonstration, that in ninety-nine courses out of one hundred he is useless without it; I would therefore recommend a great deal of slow exercise, and much less severe galloping than is usually given to them."

It is not, however, so certain as some suppose, that a great deal even of slow exercise is essential to a mature aged greyhound, especially one getting towards the downhill of life, whose joints are already knit, and his limbs and sinews are got to perfection; if, for instance, a dog is at liberty all day to run about the yard,

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have found it conducive to his success at public meetings."—*Vide Sporting Magazine*, vol. 71, p. 256. This allusion of the Translator is to that celebrated amateur of the long dogs, Mr. Hoskins. "Hounds accustomed to such privation of liberty are said to start from the slips with great fire and speed, according to the old proverb, cited by Kettershusius, in his commentary on Oppian."—*Arrian Translated*, p. 99.

in and out of the house as he likes, and to take his exercise according to his own inclination, except anything happens to rouse him, he is quiet in his temper, takes his ease as it suits him, and is quite fresh; yet he will do as much in the house as out of it, and generally get to the fireside, and choose the hearthstone to lie upon; thus you see the natural feeling of the dog for his own ease and comfort, and a dog kept in this way (a hearthstone greyhound for me, says an old and experienced courser,) when in perfect health, which such generally are, are always ready, with a very

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Many of Mr. Hoskins's contemporary coursers indulge in censure of his system of confining greyhounds, each to their own stall, by a small light chain and collar, which they term being *tied by the neck.* Now supposing them to have had a sufficiency of exercise before being so tied, (and these same parties confine *their* greyhounds within the walls of the kennel after their morning's and evening's exercise) and also if we yield to them for a moment that no particular advantage in their running is derived from the system, I would beg to ask what *disadvantage* these knowing ones can point out as arising from it, either in theory or in practice? One of these parties in particular (who will know to whom I allude) and who generally contends for the same cups, I would also ask, how many cups Mr. Hoskins has won within the last seven years, whether not as many or more than he has himself won with his *untied-by-the-neck* dogs? And further, in addition to the cups Mr. Hoskins has actually won during that period, how many more cups this same contemporary has acknowledged ought, in his own candid opinion, to have been decided in favour of Mr. Hoskins, but which were decided against him in the concluding courses for them?

I do not know the particulars of Mr. Hoskins's system of feeding and exercise when in training for a coursing meeting; but his dogs are generally allowed to *go off well* from the slips; and I have also, on many occasions, seen them have more advantage over their fellow dogs at the latter part of the course than at the former part of it; on some occasions his dog has run the hare a considerable distance after his fellow dog has lain down with the hare in view; one of these cases was at Newmarket, 1823, between his Hoyden and Mr. Gooch's Gondola; the latter, I was told, died in the field. By this system, the servant has better opportunity of keeping the kennel clean, than when the dogs are loose in it; Mr. Hoskins's kennel is *as sweet as a nut,* compared with the one before alluded to; in this kennel I could relish a good dinner; in the other could scarcely abide, without continually covering the olfactory nerve with snuff to prevent its sensibility being affected by its contact with the obnoxious odoriferous particles.

few days of higher food and preparation, for a good day's coursing. I have known many dogs treated in this way, that, when of a good breed, very rarely are beaten in the field;[1] the circumstance itself of their being well known to be got up to the mark in a short time, shows that a long time of preparation is unnecessary; and the fair inference is, that being unnecessary, it is contrary to their nature, and that their nature requires intervals of relaxation to renovate their system, which conduces to fresh fire and energy; and as old Gervase says, "keeps the powers from spending till time of necessity," and therefore you shall by no means suffer your dog to be out of the kennel, but in the hours of feeding, walking, coursing, or when you have other necessary business to do about him. I by no means intend, by stating the dog to be at liberty *all day*, that such should be the constant practice *every day*, till the few days required for preparation before coursing; because then he would not take his rest when under necessary restraint in the kennel; I would then have him frequently confined the greatest part of a day in the kennel, even if I had only one dog or a brace to manage, which might, without inconvenience, be allowed to be in the house; I only mean by the case of the dog being at liberty *all day*, to show the nature of the animal, and that such nature should be attended to, connected with his being known to be soon got ready for coursing, in the system of his general treatment pursued at times when he is not wanted for coursing, as well as when he is wanted for it.[1]

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[1] Duke Edmund says, "The childe shuld lede the houndes to scombre twies in the day, in the mornyng and in the evenyng, so that the sonne be up, especially in wynter. Then shuld he lat him runne and play longe in a faire medow in the sonne, and then kombe every hounde after other, and wipe him with a grette wisp of straw, and this shall he do every mornyng."

Old Gervase again, "Touching ayring or walking of greyhounds, which is a great nourisher and increaser of winde, it must be duely done every morning after sun-rise, and every evening before or after sun-set in this manner; as soon as you have opened your kennel, and rubbed your dogge over with a cleane haire cloth, you shall let him play a little about you before the kennel door, then take him up in your leashe, and walk him forth into the fields, where for the most part are no sheepe or other small cattell, which they may out of wantonness endaunger, and there let him loose, and give him leave to play and scope about you, so that he may skummer and emptie his body; which when he hath done sufficiently, you shall then take him up in his leashe againe, and so walk him home and kennel him; this you shall do after the same manner in the evening; and also if your dogge be strong and lustie, at night after supper, and then bringing him home, bring him to the fire, and there let him stretch and beake himself; and with your hand grope and cleanse him from ticks and other filthe, which done, leade him to the kennel, and shut him up for all night."

Arrian Trans. p. 101.

But how, or on what principle, or by what practical experience, any rational being could discover, or fancy he had discovered, any utility in *galloping greyhounds at full speed for an hour or two* every day, is what is utterly beyond my conception; it is in direct opposition to the nature of the animal, and totally, or doubly, inconsistent with the exertion he has to undergo, for which that severe exercise is intended as a preparation. It is a natural consequence for any animal to become dull and sluggish with over severity of exercise, but much more inimical and mischievous in greyhounds, whose element is fire and energy, combined with great speed, in which all are required to be in the acme of perfection. If a horse is in training to run a two or three miles' race, and perhaps repeated in having more than one heat, the trainer generally regulates the distance he gallops the horse in his training by the distance the race is to be; he does not gallop him for an hour, or half an hour, or even a quarter of an hour; he wants to brace and strengthen his muscles and parts, and to improve his wind; and he endeavours to make him as perfect as he can in that respect, thinking little of his fire and energy, as he has, in his race, the aid of whip and spur to goad him to his utmost when necessary, and the bridle to hold him back in the former part of the race, to reserve his powers for the final struggle; but how different is it with greyhounds, which, when once loosed from the slips, are left to their own unrestrained guidance? His winning does not depend on the winning post, and which dog puts his head, or even his nose, first past it; he has to *win* at the first as well as the last, so that his utmost fire is in requisition, and where it is to end is uncertain, for he may be said to carry the winning post with him throughout the course. If you could substitute for whip and spur anything in aid of a greyhound, it would, with so much severe training, be required as much at the first of the race as at any time; but the bridle is altogether out of the question; and if, by the march of intellect, he puts on the curb, and slackens his pace, he is denounced as a delinquent, as acting contrary to the purity of his acknowledged and approved nature; and by giving him such long and severe galloping exercise with horses, you teach him the sooner to show his delinquency, by depriving him of his essential fire, which in fact defeats its own object; for it is by no means improbable that this galloping him with horses was substituted for coursing him with hares, because of the latter tending to teach him to wait and lurch, if you coursed him often enough to give his muscles and parts sufficient bracing, and himself sufficient wind; and very useful the practice is, when used judiciously and with moderation, but the extent to which some trainers practise it is extravagantly too much for the time the longest of courses lasts, and contrary to what the nature of a greyhound requires to enable him to perform what is required of him; his muscles and parts are soon braced, and his wind soon got to its height.

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[1] Some idea may be gathered of the increased power and firmness of muscle by exercise, connected with or caused by the irritation of the muscular fibre, by the acknowledged difference in the tenderness of a hare when cooked, between one shot on her form, and another killed after a good course, or hunted; if killed under the latter circumstances, their flesh is tender; if they survive that exertion, after recovering from their fatigue, their muscles are more firm, as we may conclude by horses, dogs, or men, being found so after a strong exercise. *Heat* is well known to expand liquids, metals, and other things; by heat from exertion, the animal flesh is expanded, opens, separates and liberates the impure, inferior, and fatty particles, which in time go off in different ways; if they die under those circumstances, or in that state, the fleshy pores are more open, and consequently more tender, and containing the fatty matter, is of finer flavour; if they survive, these inferior particles are got rid of, and the superior particles unite more closely, and consequently become more firm and powerful.

It is not improbable, that the system of galloping greyhounds with horses has come into practice since the far-famed Laws of the Leash were first promulgated by Thomas Mowbray, Duke of Norfolk, in the days of good Queen Bess, which, as we have none of anterior date handed down to us, and nothing said by the ancient writers of any criterion by which to decide the relative merits of two contending greyhounds, as the delight and admiration of the ancients seem to dwell on the beauty and grandeur of this species of dog, with his great speed and dauntless resolution, and the pleasure of seeing the beautiful contest between them and the hare, so we may fairly conclude that those Laws of the Leash were the first that were ever framed and generally adopted, and it is said to have then been done at the suggestion of Queen Elizabeth herself; a dog, be his natural powers of speed and stoutness ever so good, if he is coursed with hares very often, he finds out their disappointing his *catch* at them when nearing them, by doubling and turning back more quickly out of his way than he can follow her, and in the course of his experience, he finds the best way to take her is to delay his lunge to a more favourable opportunity, and therefore waits, or keeps driving her before him in a sort of serpentine line, till she is about to take the meuse, when he dashes at her, and often takes her there; but by the above Laws, such a dog will generally lose his course, when contending against one, though of inferior speed, who has not learned this *wily trick*, because the Law is to take everything in the course into the account, from first to last, and therefore the wily rogue is beating himself; to give, therefore, dogs the necessary bracing and wind to enable them to maintain a long course without giving a disposition to wait, they must keep them from seeing hares so often; but by severe galloping exercise with horses,[1] they brace and strengthen them, supposing, and with reason, that when they do see a hare, they will exert themselves so much the more, from the sight of a hare being a greater novelty to them; in this way they have gone on from little to much, and from much to more, till they produce, if not the same, yet a similar effect in the dog which they meant to obviate;[1] for they deprive him of his essential fire, and also make him stiff in his joints and frame. That they may be enabled to maintain a long course better by very severe exercise, may be true; but it does not therefore follow, that such dog beating his adversary at the latter part of a course is a certain and demonstrative proof that he is possessed of the greatest stamina of the two, for by the stiffness of his limbs, and having, as Arrian observes, lost the acme of his speed and his want of fire, he does not, or cannot, go the *speed* at the first part of the course which his fellow dogs do; and as Forrester says, "Sir, what kills is the pace;" he does not lose so much stamina at the first as the other does, consequently he has more left for the last part of the course;[2] hence the wisdom of Thomas Mowbray and Company is shown, in framing Laws on so just and equitable a criterion as estimating their relative merits by taking an exact account of every performance throughout the course.

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[1] Full speed for two hours is too unqualified an expression, yet frequently used, as it cannot be supposed that they start a horse at the top of his speed, and continue him running as fast as he can go for two hours; he would stand still long before the two hours were expired; two hours, or one hour, they go at such speed as they can expect to maintain for the time; but if they gallop greyhounds at only half the speed of a horse or little more, for half an hour, it is prolonging their exertions sadly too much, to be expected to retain their wonted fire.

This practice of severe exercise with horses is by some considered so "all-in-all sufficient" to brace and strengthen them for coursing, that they are induced, with their choicest greyhounds, not to show them a hare at all between one coursing meeting and another, though a month or more may elapse between them; "but this," as old Gervase says, "is an erroneous fancy." Their muscles and parts brought into action by the doubling and turnings of the hare, are necessary to be strengthened by similar exercise, which you cannot do by galloping them with horses, nor is any other substitute invented, besides coursing them, that will have the desired effect; but to course them *often* for that purpose, is as detrimental and unnecessary as this extreme galloping system, for, from their nature, as before observed, they are soon brought up to the mark; and I am not sure that one fair course, three, four, or five days previous to their day of running, is not thereabouts sufficient for the purpose, at least for an old dog, as their parts are sooner braced, and their wind regained, than a young one; and with the latter, one fair course a week before, and another in two or three days is quite enough generally, and if not quite enough, it must be recollected that their first course at the meeting helps out the deficiency, and further, that there are generally many more short courses than long ones. It, however, by some experienced trainers, those of the late Lord Rivers's greyhounds for instance, is held that the nicest point in training greyhounds of any other, is, in judging how often to course them with hares, so as sufficiently to strengthen the muscles and parts brought into action by turning, and yet guard against learning them to wait by coursing them too often.

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[1] Every precaution which can be taken against learning greyhounds to lurch, ought to be invariably adopted, either in coursing them too often or too young, or when out of wind and condition. They are scholars by instinct—they ought to have no avocation with the schoolmaster—they ought, as schoolboys say, to *bar him out of the school* by all possible means. Their province is not to pursue their game with sagacity so much as with fire and impetuosity; but being of that species of animal in which sagacity is proverbial, if once the schoolmaster breaks in upon them, the lesson on such an instinctive and sagacious a nature, with so tenacious and retentive a memory, is never forgotten.

[2] A dog trained with this severity has need to be able to run a long course; for that same severity of exercise prevents him making the course a short one, by killing the hare as soon as he would if exercised with moderation.

You may manage an old waiting dog to run one single match honestly one day in a week, better than he will run all the ties for a cup or sweepstakes, or than he will run two or three matches, either on the same day or one day after another; after Mr. Mundy's celebrated dog, Wonder, became crafty, he kept him a week or more without seeing a hare, and when taken to the field to course, instead of having blufts on, which may be useful to keep a young dog quiet from tearing and pulling about when other dogs are running their courses, let him see the other dogs running the hares, which will cause him to struggle to get loose, and put up his fire and mettle till he becomes quite savage to get to the hare.[1]

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[1] I saw a very fat bitch that was of a crafty breed, recently run for a cup; she had been kept from seeing hares for some time, and won her first course

It is impossible to lay down a specific rule for the best quantum of galloping exercise to give for a numerous kennel of greyhounds, or of the quantity of the most stimulating food (flesh) as their natural powers and constitution vary in so great a degree; the best criterion is their fire, their muscular development, and the goodness of their running. This is what a good trainer will always have an eye to.

When you find a dog, or several of your dogs, appear to run remarkably well, and maintain his course throughout without being much distressed, it is not a bad criterion for your future government, to weigh him, a practice adopted by many coursers; then, preparatory to a coursing meeting, if you find him above or below that weight, you can regulate your food and exercise accordingly; it has been suggested to me to specify a certain weight of flesh to be given daily, in imitation of the celebrated Abernethy, in training men for the prize ring, be their size great or small, and other instances have been adduced in support of that system; but I am nevertheless not satisfied that such a plan with greyhounds would be found beneficial, and for a variety of reasons, not necessary in this place to be particularized, as they are alluded to in other parts of this work where each of them apply. How much flesh is the best possible for any one dog it is not very easy to determine.

"The watchful eye of the veltrarius is required at the time of feeding; indeed, it is best for each hound to have his separate allotment of food, so difficult is it to check the voracious and encourage the delicate when placed at the same trough."—*Arrian Trans.* p. 92. They are indeed slovenly feeders who attempt to feed a number of

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in very good style, without showing any craft; she also won her second course, but exhibited a little craft at the last part of it, having kept it in the back ground just long enough to win the course; in her third tie she began to show it about the middle of the course, and was beating a very good dog when she displayed her intellectual faculties, but to a very bad purpose, for she beat herself, and lost the cup by continuing that practice the remainder of the course.

greyhounds when in training at one and the same trough all at one time; and if coursers would be at some trouble the first few weeks of the coursing season, they might establish a criterion for the remainder of it, and without much extra trouble, of the best weight of flesh for each dog, making his full meal up of pudding.[1] Suppose, after you have got them in good heart, and fit to run for your own private amusement, (and they should never be run, even for that purpose, till they are fit, as nothing brings the march of intellect upon them sooner than running them when not in a fit state, but such anxiety to see your puppies or old favourites run, often prompts coursers to let their anxiety run away with their better discretion;) but when they are fit, suppose you fix one certain day in a week, for a few weeks, to course them, and only course them on that fixed day, which day I should recommend to be Monday, the preceding day, Sunday, being very proper for a day of rest; and I am decidedly of opinion that the day before coursing, greyhounds ought to have less exercise and more rest than on the few preceding days, and to be fed correspondingly lighter; that is, I would not stint them to less flesh, but rather less bread or other parts of their food, that the dogs may feel more lightsome. Then suppose them to have been fed for a week or two on the oatmeal dumplings before prescribed (for I must protest against the final part of the system I shall point out being a fair trial, if they have previously been fed on much slop, jelly, or other fattening food,) suppose you begin on Thursday to give them stronger exercise and more stimulating food—say for instance a gallop of a mile or more, either with horses, or having one person with whom they are accustomed to go at one end of a long close, and another person to whom they are under command at the other, and whistle them backwards and forwards from one end of the close to the other, as often as is necessary.[1]

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[1] Arrian says, p. 101, "In the winter season, feed your dogs once a day;" Markham recommends twice a day, "to wit, half an hour after sunrise, and half an hour before sun-set, when you come from walking or ayring your dogge, and it will bring him to exceeding great strength and wind. Upon coursing days you must by no means give any meat more than a white bread toast and butter, or toast and oil."

A successful modern courser feeds principally on flesh, sometimes raw, other times par-boiled, feeding lightly twice a day, with three hours' exercise, besides letting them out after feeding. And as a palliative for so much flesh, he, with short intervals, gives one drachm of sulphur and half a drachm of nitre, mixed up in a ball, and repeated eight or ten successive days, without alteration of food or exercise. This is an unnecessary and injurious forcing of the system, and not keeping the powers from spending till time of necessity.

If you have distance sufficient straight forward, it is preferable; and the best way is to take them in couples a few miles, and give them their gallop homewards; expecting to be fed when they get home, they will exert themselves the more to get to their feeder; and it would be desirable that they should be fed with a small quantity of food as soon after they get home as is convenient, for the purpose of inducing them in future to go their best speed. They should, however, be well cleaned and brushed, and made warm, and rest an hour or two before giving them their full meal, and be ready to take to their bed after they are fed.

For this purpose, good wholesome horseflesh is good enough; the weight of the flesh given to each dog should be weighed, and an account of it registered; but if that be too much trouble, you may form a tolerably correct estimate, by weighing a certain weight of flesh for the whole of them, dividing it after being boiled as equally as you can among them; say, for instance, ten pounds of flesh for five brace of dogs, allowing for what bone there may be in it, which will be one pound each; boiled nearly two hours, the fat skimmed off from the broth, a few vegetables, turnips, carrots, potatoes, and so forth; and if an onion or two be added, it gives the broth or pudding which is made with it, a flavour or smell, which will induce the dogs to eat with a good appetite, more plentifully of it; give it to them warm; shut them up at least three hours without liquids, and a good warm bed to lie upon. You can take them out for half an hour after that, if you think proper, giving them the *dessert* of bone when shut up for the night; but the same practice should be followed the subsequent weeks when you try this experiment, in every respect, or it renders the experiment abortive. It should, however, be always remembered, that a distinction is necessary to be made in the quantity of exercise given, between dogs quite old and young, or those in their prime.[1]

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[1] The late Mr. Noon used to adopt this plan with himself and his man John:—The late Lord Rivers had the benefit of the Newmarket Beacon Course for this purpose. The feeder and manager on horses to gallop on half a mile, while other men were holding the dogs ready to slip when the whistle was given, and away they went, the horsemen galloping forward till the dogs overtook them, by which they gave them a good stretching gallop as far as they thought right.

A celebrated courser of the present day sends one man on horseback to gallop before them, and another behind them with a whip—but greyhounds are animals that will sooner be led than driven; it must be inducement, alternated with restraint, as the best kind of whip for a greyhound; the *whipcord* put in the feeding trough in the shape of good clean flesh, in proper quantity, is the most likely to cause them to run with eagerness and vigour.

The next morning (Friday) give them a greater distance of walking or trotting exercise, and dispense with the horses to gallop them, but turn them loose into the most convenient field to enjoy their gallop as long as they will do so eagerly; then take them home, and clean and feed them as before. Saturday, plenty of walking exercise, and a gallop with horses for two miles up hill, (if you have the convenience of one, where the person that the dogs are running towards, is never concealed by hedges or other impediments from their sight, as if he is, they slacken their pace) is perhaps better than level ground; a less distance will do, and cause as great, and possibly more, useful exertion. Clean and feed in every respect as before; Sunday, about an hour's gentle exercise in the morning, and half an hour's towards evening; feed about the middle of the day, and do not be alarmed at giving them the same quantity of flesh because it is the day before you course them; it will startle some coursers to think of giving them flesh the day before running, but if they will not run worse without it than with it, in proper quantity, I am altogether wrong.[1] The prejudice against flesh seems to have arisen from giving too great a quantity of it when they do give it, and that in a raw state; in which it is much harder of digestion, overloads the system, and oppresses the circulation; in addition to which, they generally give broth and other liquids in quantity with the flesh; giving a moderate portion of it in their daily meals, parboiled and without liquids, is a very different thing; in fact, it makes all the difference; and I have met with no coursers who give it in that way.

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[1] A dog in his prime of life requires as much exercise as any dog; the space between the fibres of flesh is well filled up, while in an old dog that space is partly vacant, and muscles not so powerful.

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[1] Some trainers of race horses hold, perhaps to save their own pockets, when training other people's horses at their own stables, *that horses cannot race upon beans*. Others, and would-be-knowing hands, at training greyhounds, who approve of flesh generally, say they cannot *run upon flesh the day before coursing*.

The noted cocktail, Tommy Tickle, has proved to the contrary of the first, having been accustomed to a good portion of beans with his oats, but when taken to oats only, he was defeated by those he had before beat; but restored to his old diet, he defeated them in turn, and won next season seven races out of ten, clearing £695 against the best cocktails in the kingdom.

With respect to the other description of trainers, I happen to know where they have been repeatedly defeated by those who give a portion of flesh for the last few days before coursing, seldom giving any at other times, not only defeating them in the courses, but less distressed for wind at the end of them.

I do not know the precise quantity of flesh for each dog, nor the manner in which it was given to Lord Rivers's greyhounds; I only know from what Mr. Seal told me, that they feed principally upon flesh. Now it appears that he won, in the whole, sixteen cups, five goblets, or second for cups, and six sets of stakes, and during the years 1822-3-4, just preceding his retirement from the coursing field, when I was in the way of knowing particulars of his coursing proceedings, and be it remembered, at the time I knew they fed principally upon flesh, he won on the average about three courses out of four that his dogs ran at Swaffham and Newmarket.

The other courser mentioned before as feeding almost entirely upon flesh, and *without* galloping exercise with horses, but who gives sulphur and nitre to

Monday morning weigh all your dogs, and register their several weights, before you take them out to course; you should have some one to ride near them when running, observing very minutely all their performances, and particularly at the end of each course, paying particular attention to how long they are in completely recovering their wind, and if there be any difference in that respect between the two; they should be minuted in that difference by a watch.

If you find one longer in getting his wind than the other, you may be sure that there is some cause or other for it; he is either

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carry off the exuberance which so much flesh might cause to oppress the circulation, and which I deem a bad practice, Mr. D. Smith, in the years 1827, 1828, and 1830, at *only* four meetings, won thirty-four courses, carrying off two cups, one goblet, and a sweepstakes. These two instances, without any other, are sufficient demonstrative proofs of the erroneous notion which others have, however numerous they may be, that greyhounds cannot run upon flesh.

Now after all the inquiries I have made, consultations with gentlemen of the medical profession, and my own consideration of all the matters connected with it, *without knowing any one courser who adopted that practice*, I came to the conclusion that a proper portion of flesh, made up with one full meal a day of pudding, is the best food both for strength and wind; after having this food fairly tried the last season, 1832-3, with the most satisfactory result, I found, a few weeks before writing this, that my valued old friend, Mr. Hodgkinson, of Risley, near Derby, not a member of any regular coursing club, but whose greyhounds are considered pre-eminent in an extensive circle of private coursing parties, and has been for thirty successive years, and whose sound good judgment in all matters wherein he is concerned, is acknowledged by all parties who know him; I say I found, and to my great delight, that this gentleman, to whom I owe the rudiments of my own knowledge of the principles on which courses ought to be decided, I found that the food which, if I may use the term, I had puzzled out as the best, was precisely the same food which this gentleman has been long accustomed to give to his greyhounds a few days previous to coursing; namely, a portion of warm flesh, and a full meal made up of pudding, made with the broth, oatmeal, and vegetables. The coursing community will of course draw their own conclusions; but to me, *the confirmation is strong as proof of holy writ.* Here the theory of the best system of feeding is confirmed by long practice.

over fed or under fed, according to his size and constitution; and you can regulate your feeding accordingly for the following Monday. If you find any one brace well matched for speed throughout the course, and for recovering their wind after, it will furnish a good opportunity for ascertaining whether the quantity of flesh you have given is too much or too little, by feeding one with the same quantity preparatory to the following Monday, and the other with an increased or a decreased quantity, it is immaterial which, as a third trial will probably be necessary with them to decide the point satisfactorily, as to what is the best quantity for those two dogs; and by those two you have some criterion by which to regulate the feeding of your others. The greyhounds in this trial should be weighed every morning before coursing.

On this occasion, especially if they have had a long jading day, I would feed them, after making them perfectly clean and warm, wholly upon warm pudding, and vegetables in more plenty than when you give them flesh; it will be a change of diet, which Magendie has proved not only to be useful, but absolutely necessary; besides which, great fatigue will cause debility, and debility will be attended with fever, which flesh will sooner increase than allay. It must be remembered that this is only a single day's coursing; when we come to three or four successive days' coursing, I shall have some additional remarks to make on the subject.

Tuesday and Wednesday resume the oatmeal dumplings for food, giving the dogs but little exercise on the first day after coursing, and that gentle, as they require rest; the second day the usual quantity of exercise, loosing them in the most convenient field to "gallop and scummer about," as old Gervase recommends. Thursday resume your warm flesh and pudding, with what variation in quantity of flesh you deem best; and proceed in a similar manner till the next coursing day (Monday) when of course you will make the necessary observations.

By beginning this system early in the season, and adhering regularly to it, you find out which are your best, your cup or stake dogs; you find out their best quantity of stimulating, or what is termed solid and heavy food; you are preparing them with fine muscular development without "spending the powers till time of necessity," or coursing them so often as to make them crafty, and you are still keeping in reserve the good effects to be derived from a further change to the best food and exercise which can possibly be administered the week previous to your grand struggle, if engaged in any public coursing meeting in October or November, or any emulative private party; after which, you can regulate your training and management at pleasure, according to circumstances.

Before proceeding with this particular branch of the subject, it may be as well to make some remarks on puppies at the commencement of their being brought to course and put into training; my own opinion of the proper age is already recorded, nevertheless coursers will please themselves on that head.—And also to make some contingent remarks on food, as well as show Arrian's method of managing; for though he is sometimes right and sometimes wrong, according to our notions at the present day, yet some useful hints may be gleaned from him. Before doing so, I would say something with regard to what kind of food, whether flesh, or something less nutritious, is best, as there is another by dependency; and which is, if a dog comes to your kennel from another person's, whose feeding has been almost wholly of flesh or heavier food than your own, or than you approve of, and your own may be all very proper for the system your own dogs have been accustomed to for a long time; if your fresh dog has been long accustomed to a more solid food, a sudden transition from it to a lighter or less stimulating food will reduce both his powers and energy very much, and he will be a long time before he *works well* under his new regimen; so much so, that if he first comes to your kennel during, or even at the commencement of the coursing season, and has been accustomed for so long a time to live chiefly upon flesh as for it to become almost constitutional with him; I should question if you can safely wean his constitutional habit from it during that season, so as to have him completely up to the mark, as he would be with a continuance of food nearer to that of his old diet; if you have him late in the season, and he must be of any use whatever to you during the short remainder of it, taking him from his long accustomed diet is totally out of the question; but when you have the whole summer before you, he may possibly be weaned from it to run well next season on lighter diet; but then it ought to be done gradually, or the desired relaxation, before recommended, will be reduced to a general weakness and debility of frame, such as may endanger his general health, and be difficult to restore;[1] this, I have no doubt, was the primary cause of the greyhounds bought at the celebrated sale of the late Lord Rivers being complained of in very many instances for not running well; he fed very much upon flesh, with strong galloping exercise, but his galloping exercise was *not* for two *hours;* it was about two *miles* on the Newmarket Beacon Course, and I question if that were not done too often; they were better, generally speaking, at the latter end of a course, than at the beginning. I have known similar falling off in greyhounds sold from other kennels of good fame for excellent training, and if greyhounds have been accustomed to good training, they run worse under inferior training than if they had never been well trained at all.

Now although greyhounds, from their nature, are soon up and soon down in their staminal condition, yet a long habit of either solid or lighter food, especially if reared with either, if altered materially from one description to the other, the transition should be gradual, or it will be sure to have an injurious effect upon them; but the transition from the heavy to the lighter food is most to be guarded against, if you want them for coursing very soon; they may be *got up* to higher food with benefit, but they cannot well be got down in any great degree to lower food without injury.

I have before said, that there is more danger towards learning puppies craftiness by coursing them when *not in* fit condition, than in coursing them *too young;* so in a dog of mature age there is more danger in that respect in coursing him when *not* in a fit condition, than coursing him *too often* when he *is* in fit condition. This is not unfrequently done at the commencement of the season, when dogs are first brought home from quarters; the anxious courser must gratify his impatience for a course or two, as soon as he sees his favourites; or if there are puppies that were not old enough at the finish of the previous season to have a trial of their speed, or be entered, they must now have one, not only for the pleasure of seeing them run, but to know which are best, and possibly to save the trouble and expense of physicing and training the worst; on such occasions they are frequently put down with a dog of mature age, or sometimes with a brace, that they may have the better chance of being soon fairly entered, and know what they are running at; and so far it is a good practice.[1] It is, however, very unlikely, when they first come from quarters, either old dogs or puppies, that they are in a fit state to course; and one course may do irretrievable mischief, should it prove a long one, in teaching them cunning; besides which, it may do them internal injury, as they will exert themselves to their utmost on such occasions, being fresh and full of fire, and the sport a novelty to them, when their habit may be very much overloaded on the one hand, or they may, from scantiness or poorness of food on the other, be quite weak; and on either hand, their wind is not good. With a dog of mature age it is a *bad* practice; with a puppy it is *worse*.

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[1] This is an additional objection to those before-mentioned, of greyhounds being reared altogether in the butchery for a few months after leaving the dam, till old enough to course.

Arrian, p. 131, recommends "starting the pup close to the hare, that she may enjoy the sight of her game, and, by seeing it quite close, may work with eagerness. But presently slip another dog to the hare, that the puppy may not suffer by too long a course, nor flag from over fatigue; and the second dog turning the hare with ease again and again, will drive her into the puppy's mouth, when the latter should be allowed to tear her with her teeth till she has killed her."[1] Again, he says, p. 133, "Station the man that leads them upon a conspicuous and elevated spot, and be sure that he does not slip a puppy when the hare has got much a-head, and is out of sight; for if you slip a puppy out of sight of her game, she runs wide, and jumps about, and is beside herself and bewildered. And after she is full grown, if a hare happen to escape her, she is never at rest; neither returning to her keeper nor obeying his call, but, from eagerness for a course, continuing to run about wildly, like a mad dog, after nothing. Let the man, then, that holds the puppy stand on such a spot as I have stated, concealed from view at the point where it is most probable the tired hare will come in the course of her turns; and when he sees her quite weary, let him slip the puppy close to her, neither before nor directly opposite to her; for the bitch rushing right upon her will overshoot herself, and the hare with a wrench, easily skimming by, will of course leave the bitch far behind; the latter with difficulty turning herself as galleys sailing briskly a-head cannot tack, unless the rowing be much slackened before they are brought about. Let the hare, therefore, just pass by, and then let him slip obliquely after her. Some one should follow up quickly, as soon as the hare is caught, before the dogs are gorged with her blood. Not that the flesh of a hare is to be accounted of much worth by a person who courses for the beauty of the sport;[1] but it is a bad thing to teach a greyhound to eat a hare.[2] Many dogs, too, have been destroyed by gorging themselves while out of breath, after a long course, and have died by suffocation.

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[1] Arrian says, p. 100, "Never slip a strong and full grown dog with a puppy; for the old dog is an overpowering and distressing antagonist for the youngster, easily overtaking him in pursuit, and as readily running away from him, and leaving him behind; whereby the pup must of course be cowed and dispirited, having in either case the worst of the contest." This is of more importance than many coursers imagine.

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[1] M.S.—*Twety and Giffard.*—"Ye shall gif yo^r houndys the bowellis boyld with breed, and it is called reward for cause that it is etin on the erthe and not on the skin." The Mayster of Game also:—"Goodnesse of greihoundes cometh of ryght corage and of the goodnature of her fader and modir, and also men may wel helpe to make hem good in the encharmyng of hem with other good greihoundes, and feede hem wel in the beest that he taketh." "In coursing," says Markham, "you shall observe two things, bloud and labour; bloud, which is heartening and animating of your dogge to delight in the pleasure, when he finds the reward of his pains taking; for if a dog course continually, and never kill, the sport will growe yrksome to him, and therefore, now and then, give him such advantage that he may kill the hare—then labour, which is contrary to killing; for in it you must give the hare all indifferent advantage, bothe by lawe and otherwise, whereby she may stand long before the dog, and make him shewe his utmost strength before he be able to reach her."—Page 132.

With respect to exercise, independent of the distinction between gentle and strong, it is of two characters; namely, good, and, as old Gervase says, "indifferently bad." When they gallop, they should race; such as is the nature of their work when work is required of them. A half or three-quarters' speed for a long time is out of their *jurisdiction;* it is of no utility on the one hand towards enabling them better to perform their task; but, on the other, it has a tendency to prevent them *racing* so much when wanted to race, as they would without so much half galloping. As to the difference in giving more or less strong exercise, it should consist in racing them a longer or a shorter distance, or on more or fewer days in the week; it is quite immaterial whether the difference in the quantum of strong exercise is dependent on one dog being a greater feeder than another, younger or older; or on the food given them being more or less solid and nutritious; for on these varieties depend the quantum of strong exercise required. The treatment to be pursued ought to be such as will most conduce to their going a racing pace when they *do gallop*, be the distance that is deemed expedient, longer or shorter. The principle on which they must be managed is restraint, alternated with inducement, and to be under restraint in the kennel as well as out of it.[1]

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[1] "And yet we find," says his translator, "that the hare's flesh was in high estimation with epicures of old; and a coursed hare is particularly lauded by Martial, among the luxuries of a country table. In our own country the sportsman was as attentive to supply the hall of banquet with its due portion of the delicate little animal, as the kennel with its appointed halow.

> 'Thenne the loynes of the haare loke ye not forgete;
> 'But brynge theym to the kitchyn for the lorde's mete;'

sings the dignified Prioress of Sopewell, in her metrical canons of hunting."—*Booke, of St. Albans.*

[2] It is certainly wrong to allow a greyhound to gorge himself with his game, after he has been sufficiently instructed in the art of killing; but no puppy should be hastily checked when he has caught his hare, even though, in the words of old Gervase, "he may breake her."—*Arrian Trans.* p. 134.

Every practical and experienced trainer of greyhounds will pay, or ought to pay, attention to the excrement which comes from the dog; if he is very costive, or the dung of a very dark colour, or if very thin and of a pale colour, he may be sure that something is wrong; it ought to be in a medium way, both in colour and consistency. The urine ought to be free and clear, but not too copious; as in the latter case he must have had more liquids than is consistent with good wind or strength; one part of the liquids taken on the stomach is absorbed, and enters the system, rendering their fleshy fibre less firm. If they are much and often disposed to lap water when taken out in a morning, it shows something wrong in the preceding day's feeding. This may have been caused by the digestion of their solid food not going on in its regular and natural course; or being chill and cold when fed, when the efforts of the heart are directed first to the general warmth, which delays digestion, besides other bad effects; liquids given soon after, or at the same time as solid food, as before explained, or want of rest till the process of digestion has been carried sufficiently far.[2] It is proved by experiment, that the difference in digestion is very great between a dog being at rest and being at work, soon after eating solid food in plenty; an experiment was tried on two dogs, fed exactly alike in quantity and quality of solid food, at the same time; one was immediately shut up in a warm kennel to rest, and the other taken out to work for upwards of an hour; they were then both killed and opened, and the state of their stomachs examined; in that of the one that had been at rest, the food was found in a regular process of digestion; in that of the other that had been at work, the food was very little altered in appearance from what it was before he had eaten it, the agencies of digestion having been interrupted or altogether suspended. The more solid the food and greater the quantity taken on the stomach, the more necessary are these matters to be attended to. Every knight of the trigger is aware, that if he has had a long fatiguing walk, and stops to lunch, and eats heartily of solid food, and drinks a few hearty draughts of ale or other beverage, that it is all over for walking much, or if he does, it is all over for *hitting* the birds again on that day; he cannot undergo the fatigue without disordering his muscular and nervous system, and being unsteady in his aim.

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[1] The Translator of Arrian says, p. 91, "Constant confinement with chain and collar made the youthful Celtic hounds start from couples with fire, when taken to the field for sport or exercise; not so, however, the aged, whose privileged rest is beautifully touched by our classic poet of the chase, and readily yielded to by Arrian, as no blemish to his character:—

> "Now grown stiff with age,
> And many a painful chase, the wise old hound,
> Regardless of the frolic pack, attends
> His master's side," &c.—*Somerville, Book* i.

[2] A dog, if warm and comfortable, and at rest when he has eaten his food, the efforts of the heart are principally directed to the assistance of the stomach in performing its functions; but if a dog, after eating his food is in a situation which renders him chill and cold, or if he is at work or not

By the arrangement previously recommended to ascertain the quantum of flesh the constitution of all and several of your dogs will bear, and which are your best to run for first-rate prizes, I by no means intend that they shall be kept, during the whole season, in that regular routine for coursing one day in a week, having only two days of, what may be termed, relaxation; such a proceeding, I have no doubt, would make them *stale* before the season was half over; I would have one week at least, or two or three weeks together of that degree of relaxation, which the oatmeal dumplings and plenty of gentle exercise most days, would give them, if circumstances would permit of it between coursing meetings; that sort of relaxation will not reduce the muscular substance

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allowed to be quiet and at rest, the stomach is deprived for the time of that essential aid from the heart, or at least a great portion of it, the efforts of which are diverted from the stomach, and directed to other necessary purposes.

to any injurious degree; on the contrary, it will keep them at all times ready for your private coursing; and in that state they will be more vigorous and energetic from that relaxation, when their muscular fibres are brought into stronger action, aided by more stimulating food, for the particular occasions when you want them in the finest possible state of condition.[1] There is no species of dog

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[1] By this relaxation, I am the furthest from intending that they should be so poorly fed as to become meagre and lean, like half-starved animals; as no benefit whatever would, or can, accrue from such treatment; a moderate relaxation from stimulating food and strong exercise is what is required, and is indispensable to be occasionally adopted, in order to have them in the best possible state of energy and strength, by a return to that stimulating food, when they are wanted to run their emulative matches. This proper relaxation relieves the energy of their nature from the excitement consequent upon stimulating food, makes them cooler in their bodies, and to take their rest better and more quietly. Their essential fire will revive on a return to their more natural, and at all events more favourite food, flesh, as may be seen by their eagerness when perceiving they are going to be fed on it, more than when other food is shown to them; they display an evidently greatly increased joy even at the sight of it, more so than at the sight of other food, which shows its being more consonant to their nature; and their feeding of it imparts a greater degree of fire and energy in their performances, as before seen by its combined nutritive and stimulating properties.

This reminds me of what an experienced coursing friend says on the subject of fire in a greyhound, after having read the M.S. of this work under a promise, that "if he could pick a hole in my coat it should be done." He says, "An observation of yours or Arrian's, I have not time to examine which, that a greyhound is better kept on the chain, as he has more fire in him when let off, and will run better; this I hold to be erroneous; we all know any dog let loose from confinement runs about, and makes a great deal of spluttering; but what does it amount to? Why, that he has done too much in a short space of time; the conceit is soon out of him; I like a dog that is cool and deliberate in all his movements; *fire* I detest; when there is much fire it generally ends in smoke; give me a dog with plenty of natural *mettle*, that goes to his work in a cool, deliberate manner, that the further he runs the more that mettle becomes visible, which will invariably be the case if he is of PURE BLOOD."

The cool deliberation in a greyhound when he sees a hare, would give me the idea of a wary, waiting, lurching rogue, and is therefore out of my or of any other animal in which staleness is so indispensably necessary to be avoided, as in the greyhound; the fox or harehound, pointer, setter, or spaniel; the race-horse, hunter or hack, has each one means or other of being controlled in his duty; the greyhound has no impulse from whip, or spur, or bridle; everything in his course is dependent on his own will; and supposing you have an interval of a month or two between coursing meetings, and are inclined for frequent private coursing days, those dogs which you intend to run for first-rate prizes, where each dog has to run three or four successive courses to win them, such dogs should be kept from work, and be a sort of holiday dogs, and coursed very seldom, making your common hacks of your second or third-raters.

Many coursers make a distinction in their training preparatory to any meeting, dependent upon the courses at that place being

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vocabulary of excellences in that animal; but I would ask, can you have a greyhound, be his blood ever so pure, "that the longer he runs the more that mettle becomes visible," unless his food is congenial to his nature, of which nature that pure blood is a component part?

When a dog makes an energetic effort to take the hare, and she evades his gripe, he then renews his effort with redoubled determination one time after another, apparently increasing it each time, is, what I conceive, a great excellence in a greyhound, and very beautiful to see; but that the "conceit will soon be out of him," I can readily admit, if he is fed on the artificial compounds, jellies, aniseed, isinglass, &c. &c., (to the exclusion of flesh,) even if he is kept under chain, a system which some coursers think very highly of, but which was made manifest at a late meeting, where those greyhounds who had taken their chance in a farm-yard and kitchen carried away the principal prizes from those under a more refined mode of training. The fire imparted to them by a proper proportion of flesh, is neither a flash in the pan, nor does it all "soon go off in smoke." This remark is not directed to the friend who made the foregoing observations, as I am aware that he feeds his greyhounds partly on flesh; it is directed to the general reader, as confirmatory of the flesh-feeding system; he feeds partly on flesh, and he sees, and he likes to see, "the longer they run, the more that mettle becomes visible," and he is speaking from experience; the difference is still more striking by comparison, when two dogs run together, one a flesh-fed dog, and the other fed of jellies and compounds.

usually long and severe, or short ones; this is making a distinction where there often is, and where there at least ought to be, no difference, and is a mere fanciful refinement of training; long courses may occasionally happen on the same ground where the courses are generally short ones, and *vice versâ;* a dog ought to be prepared for either; if he can maintain a two, three, or even a four mile course, he can run a one mile course well, and by having only a mile course, he is in so much better a state to run many more courses at the meeting; for if you cannot get a dog in condition good enough to run a two mile, or even a three or four mile course by a two mile gallop with horses, repeated every other day, which will not deprive him of his essential fire for a short course, you cannot get him in condition for a four mile course by giving him gallops of one or two hours' duration; for by that you deprive him of the acme of his speed as well as of fire. Being deprived of those two qualifications is the most likely method of making it a four mile course, by disabling him from taking the hare for want of speed, when with galloping exercise of only two miles, he might, and probably would, end the course by taking the hare much sooner. The same substance of strong muscle, which supports the dog from being so soon distressed for wind in a long course, gives him greater speed either in a long or a short course, as that muscular power propels him along with greater force than if he were deficient in muscular substance; if therefore you provide the dog with a plentiful quantum of good muscular substance before you commence severer training, the same training will enable him to run a four mile course, if such fall to his lot, in the best possible manner; and *vice versâ.* Let the courses be supposed of what length they may, the dog ought to come to the slips in the best possible condition. If a dog is defective in condition in any material degree, it will show itself in much less than a mile running. I have, and so have many others, seen a dog fall off in his running from indifferent condition, in less than half a mile. If a horse has to run heats of two miles, they do not give four mile gallops in his exercise, because it is unnecessary, and they wish to make a reserve in his powers; if he has to run heats of four miles, they then give four mile galloping exercise, because it is necessary; in this, the distance is fixed and certain; in coursing, the distance is altogether uncertain. In the horse the food is the same in quantity and quality for two or four miles, and the distinction appropriate to this in greyhounds should be between private and public coursing; for private coursing, not to give such stimulating food and exercise, but make a reserve of their powers for public coursing; and then, and then only, to *force them.*

The best time to commence training for any particular meeting is certainly a matter deserving of consideration, as it is, in some measure, dependent upon circumstances; amongst which, the distance you reside from the place of meeting is a very important one. If, for instance, you reside within half a day's journey of the kennel appointed for your dogs to be stationed at, it will make some difference in the dog's condition when brought to the slips, between his undergoing his journey the day before, and fed after his journey, or feeding him before he leaves home, even if he travels in a carriage, much more so if he travels on foot. Rest after eating his full meal of food, that it may digest well, and resting well during the night, that he may have all the benefit of that food to nourish his frame in its uninterrupted and natural course, are indispensables to the strength, wind, and courage of so speedy and delicate an animal as a greyhound; every one knows the disadvantage of travelling far to a race horse, though he goes by what is termed only easy stages; but could he go the same distance by stages of the same length as his own walking exercise at home, even though the turnpike road is not so much his element as the turf, and could have his own stable at the end of each stage, his travelling one hundred miles would not reduce his powers in any degree to make that distance an objection. But by travelling one hundred miles, and a fresh stable every night, he is put out of his regular routine of exercise, and deprived of his regular rest, besides possibly not eating his corn so well as he would in his own stable. The more any animal is by nature formed for great speed, the finer is the organization of his frame, and the more easily is that organization disarranged, and a very trifling disarrangement in a greyhound may, and probably will, if he is nearly matched, lose him his course.

If, then, the dogs are half a day's journey from an appointed meeting, it is very desirable that such journey should be performed in the fore part of the day; when he gets to his new abode, he is cleaned and made warm, dry, and comfortable, and then fed; during which, and the last especially, he becomes reconciled to his kennel, and will rest much better than if only brought to it at night, and without any or very little feeding in it. I should fancy no one would think of sending his dog to travel on foot twenty miles, for instance, on the same day he is to be put up in the slips to run for a cup, unless he imagine that his dog, upon equal terms of condition, can distance his competitor; such a distance is much too far, because that is the particular day that he ought to have the least exercise, and the most rest; if he travels in a warm cart or other carriage, that distance is not so great an objection.[1]

If the dogs have a full day's journey to undergo, they ought to be sent, at the latest, the day but one before running, as they may have two good night's rest, and moderate exercise the intervening day; but they would be still better if sent a day earlier, when they may have a moderate gallop the day after, with additional gentle exercise in moderation.

If they have three or four days' journey to travel, they ought not to be at their appointed kennel much, if any, less than a week before the day of running, or they will run to an almost incalculable disadvantage against those fresh from their own kennel; they are shaken, jaded and dispirited, if conveyed in a cart; a fresh kennel every night, and are restless; they lose a portion thereby of their muscular substance, which even that week is not sufficient to restore, and at the same time to have their necessary galloping exercise; after journeys of such length, greyhounds require some days to restore them to their wonted ease, strength, and spirits; cowheel food, and other food of easy digestion, and nutritious, would be useful on these occasions, and they should be fed more than once or even twice in the day, to keep up their muscular substance; without that substance, you stand but a poor chance of winning your first cup course, much less your second and third, and eventually sending the cup home with the dogs.

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[1] A very good dog was brought to a coursing party, at which the late Mr. Mundy was present, which had traveled on foot for a good distance, and another that he ran against, which had traveled but a short distance; the course was long and severe, and very closely contested, but decided in favour of the short-traveled dog, when Mr. Mundy expressed his opinion, that had the other been conveyed to the ground in a cart, he would have won.

Arrian says, p. 69, "A greyhound at liberty by running about during the day, must lose the acme of his speed." If he loses in that way, how much more must he lose it by long tiring journeys?

On the subject of kenneling them, although I am not disposed to allow that *much* benefit can be derived on the score of the greyhound possessing *more* fire by constraint in the kennel with strap or chain than if loose, and otherwise under proper treatment, yet I cannot discover either benefit or convenience by their being loose in kennel; they may remove from their bed to another part of the kennel to empty themselves, thereby keeping their own bed more clean, if they have cleanliness enough about them to do that, which is doubtful with some; or they, from want of plenty of straw, and the kennel being cold, may huddle closely together, or lie one upon another to keep each other warm, from which much cleanliness cannot be expected, besides they are in danger of contracting mange and other diseases; nor can I discover when they have their full and proper quantum of exercise in the regular way, that being loose in the kennel has any advantage on the score of exercise.

On the other hand, being tied in kennel, certainly adds to their fire in degree, and makes them more savage at their game, as a house or yard dog under a chain is more savage than if loose; it tends to make them gallop more eagerly when taken out to exercise, and loosed to gallop either with horses, or in play with each other, and consequently gives them exercise of a better quality; and as Markham observes, "it breeds lust, spirit and nimbleness, prevents divers mischances, and keeps the powers from spending till time of necessity;" it keeps them from fighting, and laming or otherways injuring each other,[1] and it teaches them discipline.

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[1] My friend, who was reminded of the Irishman's expression of one feather being hard to lie upon, what must many feathers be, by seeing the beds in the coursing farmer's kennel, and who thinks Arrian sometimes right

Loosing them from their collar, speaking kindly to them, cleaning and brushing them over, after which, as Arrian says, "they will shake themselves, and show that they are pleased with the operation;" putting their collars on again, and leading them back to their beds, and calling them frequently by their names, they soon show themselves pleased with your notice; and when accustomed to be thus pleased, they are more easily rebuked when doing wrong, by one sharp word or forbidding look.

This frequently calling them by name may, in skilful hands, be turned to good account, while your dog is engaged in some emulative course; much noise and shouting during a course by the field generally is contrary to all order and decency; unfair towards the poor hare, which is frightened by it, and loses her self-possession, and consequently her life, before she has shown the real sport, or given the dogs so good a trial as she would otherwise have done. But there is no rule or reason against the owner, or some one who rides for him, to call out to his dog occasionally by name; but

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but oftener wrong, will at least allow himself to be wrong on this point, as on his return home he found his two best dogs killed, by fighting about a fair maiden. To allow dogs and bitches to be loose in the same kennel, reminds me of the moat in one brother's eye, and the beam in the other.

Notwithstanding the much admired docility of the greyhounds' disposition, when roused, they have great courage, as is seen in their running, and which is no doubt extended to their fighting; it has not fallen to my lot to see them fight, but I am told by those who have, that they fight most dreadfully savage. Markham says, "They are of all dogs whatsoever the most noble and princely, strong, nimble, swift, and valiant; so seconded with spirit and metal, and of all dogs the sorest bitten, and least amazed with any cruelty in their enemie."

What in nature can be so likely to rouse them to hostility against each other as rivalry about the female? Fighting cocks, while rearing the young ones, may be in numbers together on the same walk, without fighting, if you can keep hens from them; but if a hen comes amongst them, great warfare soon ensues. It therefore seems very desirable that greyhounds should, if for this prevention alone, be fastened in kennel, and at such distance from each other, that they cannot fight; you may then have dogs and bitches in the same kennel.

this, to have its best effect, should be reserved for a critical moment, and then it encourages him much; I have seen a dog appear to redouble his efforts by hearing his master's voice, but if done too frequently, the good effects of it are spoiled at the "time of necessity." The owner of every dog ought to have a person to ride for him, if he cannot do so himself, to take the dog up as soon as the course is over, to prevent his running a fresh hare, which is a material disadvantage in running the next tie for a cup, and also to see that he has no unfair play from others, and this person, and he alone, should have a right to cheer the dog in his course.

Arrian on this subject says, p. 111, "I am aware (even if my instructions were opposed to it,) how strong the inducement is to halloo when following a course; and that even a dumb man might break out, as is related of the son of Crœsus. It is proper sometimes to speak to the greyhounds, for they are pleased at hearing their master's voice, and have the consciousness of his presence, and of their brilliant running not escaping his notice, as an encouragement and reward for their exertions. There is no objection to your cheering your hounds as often as you like in his first course; but in his second or third, when it is probable he is fagged, I think it wrong to cheer him very often by name, lest from his ardour and desire of pleasing his master, he exert himself beyond his strength, and suffer some inward rupture and accident, which has befallen many a high-bred greyhound."

Again he says, p. 116, "When the greyhound has caught the hare, or been otherwise victorious in his course,[1] you should dismount from your horse, pat him with your hand, and praise him, kissing his head, and stroking his ears, and speaking to him by name—'Well done, Cirras! Well done, Bonnus! Bravo, my Horme!' calling each hound by name; for like men of generous spirit, they love to be praised; and the dog, if not quite tired out, will come up with joy to caress you. At this time it is a good sign for him to roll himself on the ground, as we see horses do; for it shows that he is not done up with the course, and at the same time rolling refreshes him."

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[1] It is a great point to encourage a young hound, whether he kill or not.—*Ovid.*

Plutarch remarks, "That the *canes venatici*, generally, tear their game, and lick up the blood greedily, when they kill it themselves; but if the animal of which they are in pursuit, expire from exhaustion before they reach it, they merely wag their tails, and do not lacerate it; showing thereby, that the contest was not for the flesh of the animal, but rather for the glory of victory."—*Arrian Trans.*

Arrian, it seems, makes a distinction between cheering the dog in the first course, and in the subsequent ones; if I made any distinction it would be the reverse of his; reserve the cheering till "time of necessity." His refraining from it, however, when the dog is fagged, for fear of an inward rupture, shows the great effect he considered cheering to have upon him, and especially *cheering him by name*, but this cheering should be reserved for critical moments only, whether in the first, second, or last course.

It is not inconsistent to suppose that a dog, though he appears to be running honest, and is really doing so, that he cannot occasionally make a still more energetic exertion; that fine muscular development, from the irritation of its fibres by exercise, which gives the momentum or propelling power to the animal, is influenced by the brain; Magendie says, "The muscular fibre, by its contraction and extension, as regulated by the action of the brain alone, can be carried to a wonderful extent, as is proved by the amazing strength exhibited occasionally by persons in a state of delirium or convulsion, frenzy or violent passion," and which must be equally applicable to greyhounds when excited by cheering from their master, or from other causes.

This part of the subject is not inapplicable to the various stimulants which it is the practice of many coursers to give their dogs in the field; small boluses, made of different ingredients, are sometimes given, even when put down to run their first course;[1]

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[1] These stimulants remind me of a party coursing, of that description who think no course worth having without a hare at the end of it, or as by

this is at least superfluous, except for an old waiting dog, or any dog when a short course is expected; it may be worse than superfluous; it may be injurious, and must be for a long course, where they are only stimulants acting on the brain, and not giving additional nutritious support to the body; they may cause the dog to run with more desperation at first, but he must thereby weaken his powers the more for the last part of the course. This influence of the brain over the muscles may be seen in a greyhound when taking a violent fall in a course; I have seen instances of them when flinging themselves at the hare to take her, and missing her, have rolled over several times with great violence, and when recovered on their legs, have run clean past their fellow with all the apparent desperation of a frantic, and in a few hundred yards after, have quite swerved as if dizzy and insensible. I have seen brandy, or rum and water given, when going to run again after a severe course, which may be useful in case of a short course, if given but a very short time before the hare is started; but it can only have its good effect for a short time, as in the latter part of the course they are more exhausted from running more desperately at the former part; and if given any length of time before the hare is started, the dog is half drunk and half asleep when he is slipped at her; if the dog, however, is much exhausted, he would probably lose his course, though but a short one, without some restorative or stimulant, and therefore a little brandy and water on such occasions, given just before running, may be of some advantage. Alcohol, of which brandy is chiefly composed, coagulates all the albuminous parts with which it is in contact; the liquids of the stomach contain a considerable portion of this matter; alcohol

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some is termed, a parson's course; they run a hare into a sough, and while preparing to get her out again by poking a rail up the sough, one of the party pulled out his *pocket pistol*, and gave the dogs some brandy and water, which the gamekeeper observed, whom they had not perceived to be watching them; "I say, maister," said the gamekeeper, "if you mun sarve the poor hare sitch a trick as run her again now her's fairly beaten ye, yaw should gie her some brandy as well as your dogs." *Their* temporary surprise was soon turned to mirth by the waggishness of the keeper's remark, and *his* goodhumour restored by giving him the remaining contents of the pocket pistol; he suffered the poor hare to be run again without giving her any brandy, which ended in a parson's course.

mixes with the water that the saliva and gastric juices contain; it disappears very quickly; its general effects are very rapid, and drunkenness almost immediately follows, if taken on the stomach in quantity; the matters coagulated by the action of the alcohol are, after its disappearance, digested like solid elements."——*Magendie.*

In these cases of stimulating the greyhound, the stomach is nearly empty, and there is nothing to weaken the brandy by mixing with it; it therefore sooner and more powerfully acts upon the brain.

Cockbread and *brandy* are favourite stimulants with some coursers; the former is bread dipped in brandy, such as is given to fighting cocks; a small portion of which I should prefer to any of the other stimulants mentioned; when the stomach is empty and exhausted, it must tend to restore it, and its benefit will be more durable, at the same time by taking so much smaller a quantity of brandy with it than is given in water, there is less danger from a little delay of the dog becoming drunk and sleepy.

Arrian says, p. 101, "To thrust down a dog's throat a piece of salted suet, is found beneficial." This I shall beg to decline recommending to my readers, as I would rather prefer his following advice:—"But if the weather be hot, I would have you to take an egg in your hand; open the dog's mouth, and push it down, that he may swallow it at one gulp. This will be nourishment enough for him, will cherish his wind, and quench his thirst. Greyhounds are impatient of heat, and often when pursuing a hare with all their might, have been suffocated from a stoppage of their wind.[1] To guard against which, a courser should carry eggs with him, and administer them entire, if his dog's breathing be exceedingly distressed; for there is no better refrigerative, nothing that appeases difficulty of breathing so much.

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[1] The ancients coursed all the year round; but Arrian recommends leaving off before the weather becomes very hot, and beginning again in autumn, so that it appears he coursed in warmer weather than modern coursers do. This suffocation is very probable in the hot part of the season in warmer climates, especially if the dogs be fat; they do not throw off superabundant matter by the skin, as we do by perspiration; it must be got rid of by exhalation, and that matter passes through the mouth and nostrils; the petuitary membrane

The yolk of an egg contains the most and best nutriment in the same weight and compass of any food you can give, and is the soonest digested; and according to the old song,

> "When Bibo thought fit from this world to retreat,
> As full of champaign as an egg's full of meat."

It must afford the dog as much nourishment in as short a time as anything; it will nourish the stomach, which has, in degree, an immediate effect in invigorating the animal, for if the stomach is exhausted, every other organ has a sympathetic want of vigour; the eggs occupying so small a space, that it cannot impede the action of his lungs when running; but instead of giving it him entire, as Arrian recommends, which must include the shell, I would on such occasions not only exclude the shell, but the white also, which neither contains so much nutriment as the yolk, nor is so soon digested, and by which you occupy less space on the stomach to impede the action of the lungs.

We know from experience, that greyhounds run well upon eggs, which is to be attributed to their containing so much nutriment easy of digestion, in such small weight and compass; but were they to feed wholly upon them, so as to appease the dog's appetite, and allow him to rest well, his blood would be too rich, and the circulation oppressed so as to impede the action of the lungs, and obstruct his respiration; besides, to satisfy his appetite, and keep him from repeatedly craving for more food, he must be fed early and late, and many times in the day, with such easily digested food, and would require all the eggs in the *parish*; and to boil them so as to give them more solidity, it is proved by Magendie, that though they

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of the nose, which is the conductor of the phlegm, is soon charged with it so as to enlarge it to a degree sufficient to stop entirely the passage of the air, in both expiring and inspiring, through the long narrow passages of the nasal cavities; hence breathing can only be through the mouth, the difficulty of which increases every moment as the dog becomes oppressed by continued exertion.

will live a long time upon *them alone*, they are yet meagre and weakly; nevertheless, even in preparing a dog for a coursing day, as an auxiliary to his more substantial food, they are the best articles you can give, and I should almost say the only ones you can give with benefit.[1] In the coursing field I have never used them myself, or known any one else to do so; yet on considering the theory of the matter, I must confess that I feel some surprise that such practice is not followed. If a dog has run his course for the cup early in the day, and if it is inconvenient to take him home to be fed at the usual time of feeding, it is the practice with many to give him a slice of cold meat, beef or mutton; but sometimes the arrangement for the day is altered, as circumstances occur, and the mutton-fed dog is unexpectedly called upon to run; others that have run a match, and have to run again in some little time, have a gingerbread button or two given to them; but I conceive that the yolk of an egg or two would answer either of these purposes better than anything you can give them.

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[1] A greyhound bitch that I took to join a coursing party, had her tongue up, and recovered her wind so soon, and so little distressed after her courses, that the servant lad who led her was surrounded by inquirers as to the manner in which she was fed; neither he nor I knew that she had been fed in any particular way, but a few days afterwards the bitch was detected robbing hens' nests; on inquiry it turned out that her dam, when suckling puppies, was in the habit of robbing nearly all the hens' nests in the parish in the night, carrying one egg at a time in her mouth to the puppies, and breaking it before them, and then going for another, which learned the puppies to be fond of them, and they, being *apt scholars*, soon followed their dam's example.

Eggs are considered as composed of part animal and part vegetable nutriment, and therefore very nourishing to either man or dog. Thirst is a sensation they feel after a course more than any other; while it remains, the desire, or even attention of man or beast, is partially abstracted from every other object, and the spirits depressed; the yolk of an egg, or of two eggs in preference to both the yolk and white of one egg, allays that thirst more than anything you can give him; the small space it occupies on the stomach cannot interfere with the action of the lungs so as to affect his wind, and its nutritious qualities tend more than anything else to nourish and renovate his whole system.

When I come to that part respecting feeding best when preparing for a coursing meeting, I shall have to make a few further remarks on eggs; but as I am now on the subject of restoratives in the field, I may as well finish what appears to me necessary to say on that subject.

I have known a warm bath used to restore a dog's vigour after being very severely coursed, and he has won his course after it; but I am not prepared to say that the bath was the cause of his winning; I never knew it used but on two occasions, and then not to the best advantage; at the same time, I conceive that the bath, with a proper interval of time after it, and proper management, contrary to the brandy, may contribute to support a dog's strength at the latter part of a course as well as the former; but without that proper interval and management, it is certainly a disadvantage at the first part, by inducing sleepiness, and the uncertainty of its being any benefit in the latter part.

A bath from 90 to 95 degrees of heat by Fahrenheit, for five or ten minutes, will remove the stiffness of the joints, giving a pleasant suppleness to the frame, and by being wiped quite dry, and clothed, and put in a warm kennel with plenty of straw, "enough for a lying-in woman," will induce sleep, by which the dog rests, and is refreshed; creates what in us we should call a perspiration, which braces his muscles, and gives him strength.[1] The extraction of the perspirable matter eases the circulation of the blood near the skin; inhaling the warm air softens the lungs, and allays inflammation. This may very rarely be available for a dog to be restored to vigour, to run again on the same day that he has had so severe a course as to require a bath; but if he has been distressed in an extraordinary degree one day, and has to run again the following day, it may be had recourse to without much trouble or inconvenience, and on the contrary I conceive with great benefit. The earlier it can be done that day the better; his stomach should be restored by a little warm broth while the bath is preparing; then put him in, and brush him well over while he is in it; wipe him perfectly dry, clothe him warm, and put him to bed; there leave him, till his appetite rouses him from his slumber; then brush and wipe him well over again, and give him the same food you would have done had there been no occasion for the bath; after which he may be left for the night, and will turn out next morning very greatly invigorated.

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[1] Notwithstanding there is no moisture by perspiration on the skin of a dog from its not being sufficiently porous, the same matter is got rid of by exhalation from a warm bath in a similar manner to that created by severe exertion.

With respect to greyhounds wearing body clothes in the kennel except in very cold weather during the season, it is not a good plan; the kennel should be warm, dry and clean, and the dogs kept in as regular a temperament of congenial warmth as they can, being essentially necessary to any animal in high feeding and strong exercise, and especially to those of fine blood in great abundance, with limbs and flesh, as well as skin and coat, of a fine texture, like the race horse or greyhound, keeping the blood in a regular state of circulation. If they are unclothed in the kennel, they feel a greater benefit from their body clothes when taken out into the cold air for either exercise or coursing; if they are clothed in the kennel, they are chill when taken into the cold air; and if stripped and put into the slips to run when the weather is very cold, and some time elapses before a hare is started, they are quite benumbed and stiff with cold, and do not recover the necessary heat till the course is half over; and running against a dog not usually kept so warm, they are beat before they come to themselves.[1]

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[1] The late Colonel Mellish kept his greyhounds very warm, and was warned against it, as making him likely to have his best dogs beat some day or other by some butcher's dog. This was by Mr. Daniel Lambert, celebrated for his great weight and bulk as the greatest man in England, and an amateur of all kinds of sporting dogs.

The Colonel ran a main against all Essex; they won course for course till the last, or *lion* course; which course, though a very long one, was undecided, and the main drawn. It was his best dog, and the other a bitch belonging to a butcher, which caused him afterwards to relate his conversation with Mr. Lambert. He bought the bitch for fifty guineas, and there is every

I have before admitted, that greyhounds will run, what is called well, on cowheel, biscuits, and broth. So they will on sheep's trotters, well cleaned, broken, and stewed, with bread, &c. They will run apparently well, in ordinary coursing, if fed on bread and ale; but I apprehend that such would cut a bad figure against a flesh-fed dog, even of horseflesh, and otherwise well managed, on Salisbury Plain or Withcall Warren; their high courage will cause them to run tolerably well on improper or inferior food; but if an amateur of coursing is to do the thing at all, to attend a regular meeting, it should be *well* done; it then becomes a question whether horseflesh for that purpose is sufficiently good; sufficient quantity and quality of nutriment, and sufficiently easy of digestion;[1] or whether it is not worth while, for such purposes,

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reason to suppose that she was the dam of Mr. Hassall's Madam, from whom descended Claret, Bergami, Vengeance, Hercules, and many others celebrated in the annals of coursing, as winners of cups and sweepstakes, down to "the third and fourth generation," without disgracing or being disgraced by the mixture with good blood from other kennels.

[1] A celebrated amateur of the Leash in the sister isle feeds his greyhounds on venison, perhaps in imitation of the old huntsman, Pan. Many coursers in that island would not feed their greyhounds with horseflesh if you would give it them, preferring being at the expense of purchasing good beef or mutton. This practice was reprobated as shameful, inconsistently enough by the party, while so many human beings were in want of it; he who cried shame was, day after day, and year after year, pampering himself with every delicacy and luxury of the season, without paying *very extraordinary* regard to the wants of his fellow creatures; if a man has a right to pamper himself, he has equal right to pamper his dogs with what is his own; but to obviate the charge of shamefulness, good beef or mutton, on the occasion of coursing meetings, is not deserving the reproach of pampering; it becomes necessary.

A coursing friend of mine says, that the flesh of an ass is the finest food for a greyhound; the grain is fine, something like that of mutton, and mutton is similar to venison; the flesh nutritious, and easy of digestion; I do not doubt the truth of this, but cannot speak from my own observation, having never seen any. Another friend says, he never saw a dead ass, and has inquired of others, and never met with a person who had seen one, and therefore concludes that asses *never die*. This reminds me of what was to be at a little additional expense in procuring for them flesh containing more and better nutriment, such as the lean part of beef or mutton, to have them in the best possible state of condition; or in other words, to *do the thing well.*

Independent of horseflesh, of the best sort, not containing that pure quality as well as quantity of nutriment which is contained in good beef or mutton, it is also subject to many other objectionable qualities; it is rendered cartilaginous and ligamentous by strong exercise and labour, and contains a greater portion of glutus; the former rendering it much harder of digestion, and the latter *less purely* nutritious than beef or mutton; it is true that this objection is weaker in a very young horse that is fat or fresh, which may happen by accident to be killed, because his flesh is not so hardened by labour; but medical men recommend to their patients the flesh of full grown animals in preference to very young ones; beef in preference to veal, and mutton to lamb, as imparting more strength to the frame and constitution; and as the animal arrives nearer to maturity, the intervals which separate the

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quaintly remarked by a waggish oddity who sometimes makes trite remarks when asked about a young lady that was to be married to an attorney, who they thought was a very good and *honest* young man. "Why, as to that," said he, "an honest lawyer and a dead jackass are two things that are very seldom seen."

As these two descriptions of flesh are not every day *come-at-ables*, one from expense, and the other from rarity, if I may be allowed the exercise of my homely muse, I would say,—

Since then park deer are dear in price,
And asses' flesh is scarce as honest law,
The greyhound must forego his slice,
And trust to *other food* to fill his craw;
But if perchance he wins a cup,
And then to feast he craves his master's benison,
The ass's haunch must be cut up,
For surely asses' flesh is greyhound's venison.

Many asses, however, are killed at the Veterinary College in London, and the flesh sold for dog meat.

muscular fibres are more filled with nutritious matter; the muscles become thicker, and increase in volume; according to Magendie, "the muscles of the full grown animal appear to contain more *fibrin*, *osmazone*, and *colouring matter* of the blood;" the nourishment of the muscles decreases very sensibly in old age; the intervals are left empty; it therefore cannot impart the same nourishment to those who feed upon such flesh, as it does in the prime of maturity; the fibre becomes tough, and harder of digestion; the culinary preparation of muscular flesh is very different, according as the animal is young or old; the broth made of the flesh of young animals has a savour, colour, and consistency *quite* different from that which is made of the flesh of those that are full grown.

Hence it is obvious, that to have the most nutriment and the easiest of digestion in the same weight or compass, it is desirable that the flesh should be that of an animal that is neither very young nor very old.

Generally speaking, cows and sheep are killed at that age when their flesh affords the best nutriment. Horses very differently so; for with the exception of accidents or illness, they are old and worn out, often dying of old age or disease, or killed from being no longer useful from infirmities, consequent upon old age; so that it very rarely happens that you can have horseflesh of a very good quality; and then, if it is full grown, it has so much of that glutinous property, which is objectionable by thickening the blood and oppressing the circulation, so as, in a greater or less degree, to obstruct respiration.

Good horseflesh may, nevertheless, be sufficiently suitable for ordinary occasions, and a dog will derive additional benefit by a subsequent change to beef or mutton, for extraordinary ones of emulation, contending for cups or other prizes of great value, and what is of still more importance, having to continue that contest for three or four successive days; it then becomes necessary for the greyhound to be in the best possible state of health, strength, and wind, for which the most and best nutriment in the least weight or compass is requisite.

For this purpose, it appears by the relative nutriment and digestibility of beef and mutton, that the lean part of good beef is to be preferred for the few days or week previous to coursing; and the lean part of mutton for those days, during the meeting, where the dog cannot be fed till late, and has to run again next morning; fat being rejected in every manner and shape; as fat is very objectionable for a dog in his highest state of training, good beef or mutton must be cut to waste for it to be of the most service, the liver of an ox or cow may be substituted with advantage; as, however, warm food is advisable on these occasions, and as it is necessary to divest the liver of its watery and heavy parts, by boiling, and then being hung to dry for the greatest part of a week, it would be sufficient to boil it not much more than two hours before being hung to dry; and when wanted for warm food, to cut it in slices of nearly an inch thick, and put them before the fire, or in the oven, a sufficient time to warm them through—then give the same quantity with the pudding to each dog which you would of beef or mutton. This is a cheap, serviceable, wholesome and convenient food for them, possessing all the stimulating and exciting properties, nutritious, light and easy of digestion, which are possessed by the ordinary flesh of animals; the best quantity for each dog may vary under some circumstances, but from a pound to a pound and a half will be found not far off the mark; about three parts cooked, and given warm to the dog; a full meal made up with stiff pudding, in which is a portion of vegetables, and if mixed up with broth, the fat of it to be completely skimmed away; fine wheaten flour containing more nutriment, according to Sir H. Davy, than oatmeal, will of course make the pudding the most strengthening; and any additional nutriment you wish to supply the stomach with, should, on those occasions, be by giving them raw eggs; a skilful trainer will soon discover, by the state of the dogs' condition, whether one egg at night is quite sufficient, or whether more than one is necessary, and give them accordingly; when they have had their full meal about the middle of the day, they should be kept warm and at rest, and without liquids of any description for three hours; after which, if they lap a little water, it assists the stomach in forwarding the nutriment finally into the whole animal system; at the same time a little of it is better than much, and therefore water should be preferred to broth; of the former they will lap no more than is necessary to quench their thirst, which they probably would do, if good broth is set before them. If they are taken out of kennel before night-fall for a quarter or half an hour's walking exercise, coupled two and two, it would have no ill effect towards their mid-day meal, but on the other hand it would tend to make them rest better during the night; you may then give them their eggs and a few bones before shutting them up for the night; the eggs, however, are scarcely necessary till the last two or three days before coursing; but the bones I would seldom omit a day without giving them a few. When you give many eggs, there should be a degree less flesh, in which case I should prefer a pound only, as being better than a pound and a half.

With respect to exercise, it must be evident, that with so much nutriment which they will receive under this mode of feeding them, that they will require plenty of exercise to prevent the habit being too full, and to harden and compress the muscular flesh, (of which with this feeding they will have a good portion,) into its required powerful state of capability.

The galloping portion of that exercise with horses need not be above three days in the week, or every other day; nor need that gallop be much, if any, above two miles, inducing them, if possible, to go those two miles about their best pace. It may, however, be desirable, and if they have not been coursed for several weeks, it will be absolutely necessary that they should have a course, which will reduce the horse galloping part to two days; a good fair course about the middle of the week will be stronger exercise than the galloping with horses, as the whole animal fibre will be on the utmost stretch, and will be, on all considerations, the means of strengthening their muscles and improving their wind; and in addition, it will in particular strengthen the muscles and parts brought into action by turning the hare, without which, if they meet with a strong hare for their first course at the meeting, those parts not being strengthened by exercise, her frequent turnings will distress them much, probably losing the dog his course, or if not, it will cause so much exhaustion and consequent debility as he will not have time to recover before running his next course, and will thereby be ultimately defeated.

Those days when they are coursed or galloped with horses, they will not require so much of the gentle exercise; they should nevertheless not have less than an hour's walking, or part trotting exercise; those days when they are *not* galloped, they ought not to have much less than three hours' gentle exercise; they had better, as has been before remarked, be coupled two and two, and in the nearest field proper for the purpose, loose them and let them gallop about as long as they *will do so eagerly*, after which, couple them together again, and let them walk or trot on the road for the time specified.[1]

They would be better to take their exercise without body clothes, unless the weather is very cold, as encumbering them unnecessarily, renders them nesh and chill at times when they are wanted to be without them, and makes no reserve for "times of necessity."

When brought back to the kennel, they should be made perfectly clean and dry; using the brush pretty freely, has a tendency to produce warmth by promoting a free circulation of the blood, and an artificial exercise, by irritating the muscular fibre; they should be made warm and comfortable, and rest an hour or two before being fed; but as the vigour of the stomach to eat their food is of some importance, it is better to give them a trifling quantity as soon as they are well cleaned over, which should be immediately after being brought back to the kennel. The sensation of hunger, and the proper secretion of the gastric juice, is dependent on the nervous energy of the stomach, and on these depend their eating with a good appetite, and their food being regularly digested, and of course affording the best nourishment and strength to the animal.

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[1] "Some coursers make a practice of washing their greyhounds' feet with salt and water to harden them, previous to traveling much. But to the constant use of salt and water to their feet, there is a strong objection; it hardens, indeed, but it heats some feet to such a degree, that they crack as if cut by frost; it is very common to see dogs dead lame from that cause in a week or two, and scarcely able to make a gallop. This relates materially to strong dogs of a robust habit. When this happens, the best remedy is instantly to take them out of exercise for a week or ten days, and wash their feet over night with nitrated water, in which have been infused a few drops of tincture of opium, and in the morning with butter milk, or milk and water. Pure water afterwards is the most proper for their ablution. To some feet, nevertheless, salt and water may be occasionally and discreetly used."—*Sporting Magazine.*

Isinglass boiled in milk, which settles into a jelly, is given them by some coursers at the time of cleaning; but this, it is before shown, neither affords them much nutriment, nor does it get off the stomach before the dog has to eat his full meal. The light substance most conducive towards strengthening greyhounds, creating energy in the stomach, and yet be cleared off before they eat their full meal, is either the yolk of an egg or cowheel jelly, made in the following manner, and given warm:—

Stew the cowheel till the bones separate from the tendon, &c.; then take the bones out, and continue the process of stewing till all is reduced to one consistency; while it is warm, and in a liquid state, mix a little fine wheaten flour with it, and when cold it will be quite solid, and keep for many weeks; a few ounces of it for each dog.

Unless you have reason to suppose, by the appearance of the dogs, or lolling their tongues out for any length of time after their gallop, that the quantity of flesh given them is too much or too little, I would not vary the quantity much during each day of this week's preparation; the necessary variation of the aliments may be in more or less vegetables in the pudding, or varying the sort of them, or making it some days of wheaten flour, and others of oatmeal.

Some coursers gallop their dogs with horses on the morning of coursing, a practice of no utility whatever, but a disadvantage rather, if done to any extent; a quarter or half an hour's walking exercise may, without injury, be given, and loose them to gallop for a short time of their own free will, tends to strengthen the muscles of their lungs; well brushing them over will do what is most necessary at that time, as it irritates and compresses the muscular fibre without allaying their fire and energy as much galloping would do.

It is necessary on the morning of coursing that they should have a small quantity of light food, to keep their stomachs from being exhausted; which exhaustion will at least oppress the spirits of the animal, if it does not create a degree of debility in the frame; Markham says, a white bread toast and butter, or a toast and oil. I have known dogs run exceedingly well with bread toasted and soaked in strong old ale; give the ale to the servant, and about two meat spoonfuls of the soaked bread to the dog, with a raw egg.

This arrangement is supposing your greyhounds to be free, good feeders; it would be all "vanity and vexation of spirit" to pretend to lay down a system of preparation for a very delicate feeding dog, to run for a cup three or four successive days; he may be fed to run one day tolerably well, and many of them are very fleet; but it is of no use his coming again the second or third day, for he cannot come again to advantage; he will probably eat little or nothing after coursing, and he has not the stamina within him to run a second day. Even for one day's coursing you have no choice of management for him; you have to get him to eat anything he will, and as often in the day as he will, a little at a time; a good warm kitchen, with a recess for him to retire to at pleasure, is the best kennel for a greyhound of that description, and all the small bones you can muster to give him; he will eat them if he will eat anything. Mr. Mundy ordered all the fish bones they had to be given to a very delicate feeding greyhound he once had, that was remarkably swift for one course.

The necessity for greyhounds being conveyed to the field in a covered warm cart or other carriage is so obvious, that little need be said on that score, even if you have no distance to travel to it; if they travel on foot, and some of them have to wait hours before their turn comes to run, they are chill and cold, possibly wet with rain; liable to be rode over, or trodden upon and lamed; struggling and pulling about when other dogs are running their courses, and very frequently slipping their collar, and running an extra course; then waiting again in the cold after running a severe course, and many other disadvantages they labour under, from all of which those that are in a secure cart are entirely free.

If you feed your dogs about noon the day before coursing, and they cannot be brought home and fed after coursing till late, possibly after dark hour, they will have been twenty-eight or thirty hours without any satisfying quantity of food on their stomachs; consequently their stomachs are exhausted and debilitated, and in a very improper state for taking a full meal of solid food upon it; besides which, they are probably chill and cold, and if fed as soon as brought home, the food would not undergo its regular and natural digestion, the efforts of the heart being first directed to the general warmth; and cleaning them after being fed their whole meal, is disturbing them from their necessary rest for that digestion; therefore, their food would not nourish them so much, and their wind would not be good next day if fed their full meal without some previous preparation of their stomachs and frame.

A small quantity, (say half a pint or a pint each dog,) of warm broth, (the fat skimmed off;) then clean them well, and make them warm by giving them a good quantity of straw to lie upon, "ryghte thycke," as Duke Edmund directs; and by the time you have thus cleaned them all, prepared their food, and "done all the necessary business about them," their stomachs will be restored and invigorated, and the watery part of the broth will be separated from the alimentary part, and passed away from the stomach, so that they will eat their meal with every advantage towards its regular digestion and proper nourishment of the frame.

Without this preparation, when their stomachs are exhausted and debilitated, it would not be advisable to feed them upon flesh, as that debility will be attended with some fever, which flesh, in that state, would tend to increase; but with this preparation, flesh may be given in proper quantity, without any disadvantage on the one hand, and with its usual benefit on the other; even supposing it is late when you feed them, and they have to course again next morning.

On these occasions, however, mutton, divested of its fat, should be preferred to beef; it possesses a degree less nutriment, it is true, but is nevertheless very nutritious, and moreover, according to all the authorities mentioned, it is much easier of digestion; or the liver of an ox or cow, previously prepared as before stated, and fresh warmed; but should your dog be delicate, or exhausted to such a degree that you deem it proper to have recourse to the warm bath, by which his feeding may be delayed a few hours, and thereby give less time for the aliment to be thrown over his whole system, to give him the necessary vigour for coursing early the next day, the digestion of the flesh given him may be accelerated without loss of nutriment, by cutting it into small bits before feeding him; and there are cases in which beef tea two hours afterwards would be serviceable; Magendie, Sir Astley Cooper, and others, have in various experiments found that the smaller pieces of flesh, when a dog has been killed and opened in a given time after feeding, have proceeded much further in the process of digestion than the larger ones of the same flesh; thus a pound of flesh, cut into small bits, may either be given him alone, or mixed with the pudding; the latter may be preferable, if he is rather a delicate feeder, as inducing him, by the flavour of the flesh, to eat more pudding than he otherwise would do. This mode of accelerating digestion may, by some, be thought advisable to be applied on other occasions, when there is no particular exhaustion, or delay in feeding; but this idea ought not to be encouraged, for with regard to a dog having the best and most perfect rest, his sleep should be undisturbed or uninterrupted, which interruption may be equally caused by his stomach being overloaded with undigested food, or by the cravings of hunger, by the bits of flesh being sooner digested than when in larger pieces.[1] "By sleep, which is the immediate effect of the laws of organization," says Magendie, "its regular return is one of the circumstances that contribute the most to the preservation of health; *its suppression, even for a short time, is often attended with serious inconvenience;* by uninterrupted peaceful sleep, restrained within proper limits, the powers are restored, and the organs recover the facility of action; sleep results from a suspension of the action of the relative organs of life, and from a diminution of the action of the nutritive functions; the circulation and respiration are retarded, yet the nutritive functions continue in sleep, though their action is more slow." Hence, though rest is essential after eating a full meal, sound sleep is prejudicial to digestion, and dogs should be fed some hours before being shut up for the night.

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[1] Arrian was so sensible of the necessity of a dog resting well during the night, and of the bad effects from indigestion, causing want of rest, that he recommends his sleeping with a man, in order that his bed companion might be able to know whether the dog was in a fit state to course, from his not having been restless and uncomfortable.

The inference deducible from this, relative to feeding a dog with the best effect under particular circumstances, requiring the best possible restoration of his powers, is, that he should be so fed, that his rest be not disturbed by his stomach being overloaded with undigested food, nor by the cravings of hunger; for during sleep, even the circulation of the blood is retarded, and the whole organization undergoes a regular and uniform relaxation and ease, after which they are restored, and recover the facility of action. Then, if you feed a dog wholly of food that is digested nearly all together, and in one or two hours, cowheel, farina, &c., for instance, instead of part flesh, which requires nearly five hours before it is converted into chyme, you at once deprive him, in all probability, of three hours' uninterrupted rest; of three hours of that best of rest, *uninterrupted peaceful sleep;* for he will undoubtedly have his stomach free from food sooner by that space of time, and if hunger does not come on immediately after, but is delayed, as may be alike the case in both instances, yet hunger will come on sooner by that space of time by one sort of food than by the other. This applies, though in less degree, to cutting the flesh into small pieces or bits, before giving it to him; as instead of depriving him of three hours' rest, it may deprive him of only one or two hours, but which is an object on particular occasions, and therefore cutting it into bits should not be practised but in cases of necessity.[1]

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[1] After this work was prepared for the press, I unexpectedly met with information which I had, before, in vain endeavoured to procure, namely,

I do not approve of, what is termed, only half feeding them when they have to be fed rather late, and have to run next morning; it is very seldom that they run before eleven o'clock next day; it may be twelve, or one, or two o'clock, or even later; if therefore you feed by four o'clock the previous afternoon, the dog has about twenty hours for the food to undergo its process, and his body to rest; and if your feeding is driven to eight at night, he has abont sixteen hours; either of these times are amply sufficient for those purposes under ordinary degrees of previous exertion; Dr. Ferguson says, as before stated, "that the digestion of the dog, or rather the digestive process in the dog, goes on most rapidly, and the absorbents are very active in conveying the nutritious fluids, which eventually enrich the blood, and fatten the animal." This idea may be carried too far; according to Magendie and others, the digestive process goes on more rapidly in man than in the dog; nevertheless, under circumstances of very great ex-

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the system pursued by the late Dr. Bellyse in the management of his greyhounds, in respect to preparation for the coursing field.

An old neighbour and intimate coursing acquaintance of his informs me, that when not expecting soon to course them, they had anything to eat which happened, or was most convenient, taking care to keep them tolerably high in flesh, and plenty of gentle exercise, chiefly on the road. Four or five days before coursing, he commenced feeding them on cows' liver, previously prepared in a similar manner to that I have before recommended, *feeding them on that alone, one full meal a day, without being particular as to giving them any great quantity of galloping exercise.*

Having this information from one who lived near neighbour to him for many years, and a coursing acquaintance, I have a right to assume it to be correct, and that it may be relied upon as such; and I confess it gave me much pleasure, as being the system of a person so eminent in his medical profession, and so celebrated for his superior knowledge in sporting matters, it serves very much to support me on several important points in greyhound training, which, in this work, are previously "written and set down."

Those coursers will find, who advocate jellies, compounds, light and easily digested food, in preference to flesh, and say that dogs cannot run upon the latter; two half meals a day instead of one full meal; two hours' galloping haustion, from extraordinary exertion and long fasting, it would not be advisable to feed them entirely full; I would, however, make a distinction in feeding them under those circumstances, dependent upon whether they have to run next day, or have an intervening day, as at Louth, where they course Tuesday, Thursday, and Saturday; in the former case, what reduction is made in quantity should be in the pudding, with the same quantity of flesh as before, only of such kind, and given in such a manner as is easiest digested, having less tendency to increase the fever attendant on debility; in the latter case it would be found better to stint them in the quantity of flesh, and feed them but lightly of pudding; I have repeatedly noticed it in both dogs and horses, and have experienced it in myself, that after severe exertion and long fasting, with light warm food and in moderate quantity, at night, there is less fever and debility next morning than with more solid food and in greater quantity.

This may, *at first sight*, appear rather paradoxical, or inconsistent with my recommending no reduction in the quantity of

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exercise, day after day; kept in a constant routine of training during the season, (I marvel they do not the same out of the coursing season also,) besides several other minor points in their refinement of training, are here virtually out of the question by a very high authority; an authority deserving as much attention as any we have.

Possibly his son, his intelligent son, for so he will, I hope, excuse me denominating him, as all coursers know him to be such,) may have improved upon his father's system, for we know in what beautiful condition he brings his greyhounds to the slips; but with his present system I am unacquainted. As, however, every one is partial to the "bantling of his own brain," so may I be permitted to retain my opinion, and adhere to the system of a proper proportion of flesh with other food of different degrees of digestibility, in preference to all flesh, under which class I here include liver, not omitting a small portion of bone with his other food, and again the last thing at night, with a few raw eggs.

In this I am borne out by the various experiments of Magendie, whose authority runs no risk of being controverted, being supported by sound theory, and found good in practice.

flesh after great exertion and long fasting, when he has to course the next day, as if there be fever in one case there is in the other; granted; no one would course a dog next day under such circumstances, if he could well avoid it; but if he must either run his dog or forfeit his cup that he is contending for, he chooses the former; in which case the dog must be *forced* in his food, as far as is prudent with his chance of winning it; but in the other case, where you have an intervening day, you have more time to remove the fever, and to stimulate him with solid food afterwards. The former case is matter of necessity; the latter is more matter of choice; it is, therefore, no paradox; by this means the appetites of dogs next morning will be more keen, and their stomachs stronger and more vigorous in the process of digestion; you can feed them earlier than their usual time, giving them more flesh to strengthen them, (a consideration out of the question in the other case,) and can also add to the nutriment in the evening by an additional egg or two, with the usual *dessert* of bone.

Much exercise, the intervening day, is not required, and would have an injurious effect if extended further than perhaps an hour's gentle exercise, and half an hour's towards evening, with being loosed to gallop about of their own free will in some convenient field in their morning's exercise; they require rest, even if they have only run one course of moderate length; taking them out into the open air while their kennel is being well cleaned, removes any stiffness in their limbs, and they enjoy rest better for it when *they are* in kennel; but to gallop them on such occasions with horses, which some coursers do, is the reverse of any utility; if Arrian's remark is worthy of attention, and it undoubtedly is, that "a dog running about all day loses the acme of his speed," it must apply still more strongly against galloping them severely with horses the day after having been coursed; they have not only run a course, but have been kept out of kennel five or six hours, either walking about, or may have been chill and cold in a cart, and are jaded with it; but even had the course been a short one, and the dog brought soon after to his kennel, much galloping would be useless; as some dogs, however, undergo less severity of coursing and other fatigue than others, a distinction ought to be observed by their trainer in the quantity of exercise given them. Some of your dogs may not course at all the first or second day of the meeting; such, when they come to course, will stand in the same situation as the other dogs did on the first day, and their previous management ought to be governed accordingly; these varieties can only be provided for by the trainer, according to the circumstances as they occur.

I cannot call to my recollection a single instance of any dog eventually winning a cup which had run a very severe course in his first tie for it; but have, on the contrary, known many cups won by dogs that were fortunate in having *short* courses in their first and second ties; the first cup I ever saw run for, above thirty years ago, one of the dogs had a short course for his first, which he won, and a very good judge, before alluded to in this work, Mr. Hodgkinson, immediately remarked to me, "Mind if that dog does not win the cup; he goes like racing, and has had a short course, which makes more difference than some people imagine." The same dog eventually did win the cup; the impression left on my mind by the circumstance has caused me ever since to pay some attention in the first or second ties to which dogs had the longest or the shortest courses in those ties; the result of which has long ago convinced me of the indispensable necessity of bringing the dogs to the slips, in the first instance, in tip-top condition, both in strength, wind, and fire. Acting on that principle offers the best chance to make the first course a short one; the first being short is the most likely, from the freshness of your dog, to make the second course short also, and so on to the third and fourth, and eventually winning the cup. The first being short, you are at least on equal terms with the fellow dog in the second, even should he have had only a short course; but if he has had a severe one, you have an incalculable advantage over him. On the other hand, if you pursue that absurd system of making a distinction in your training between the probability or expectation of having long or short courses according to what is generally the case on the ground you are going to course over, and you have in this case prepared for short ones, you have the worst chance against all vicissitudes of uncertainty which generally accompany the proceedings to the final result; your first course may, contrary to your calculation, prove a very severe one, in which, by easy training, you stand a great chance of being defeated, and consequently entirely cut out for the cup. But even should you prove victorious in that severe course, where is your chance for the second, the fellow dog having been under good training? For although he may also have run a severe course, he will not be in such a state of debility as your dog, from your's being under the mark in condition, and the other being up to that mark. A short course in the first tie assists your condition for the second; but a severe course in the first tie, if unprepared for it, acts in the opposite manner, by debilitating the dog, and producing fever, affecting both his strength and wind, and thus greatly lessening his chance either for winning the second course, or even making it a short one, thereby further lessening his chance for winning his third course, and eventually the cup.

It is curious, but at the same time highly pleasing, to find the opinions of able men and philosophers, in their explanations of the organization of the frame, to correspond on many points with one's own experience on those points, and also to correspond in each of those points, one with the other:—

> "How many things by season season'd are,
> To their right praise and true perfection."—*Shakespeare.*

As, for instance, we all know that a certain degree of rest is absolutely necessary to sustain nature; and we find from Magendie, that "sleep results from a suspension of the action of the relative organs of life, and from a diminution of the action of the nutritive functions, and that the circulation and respiration are thereby retarded." Rest and warmth are necessary auxiliaries to digestion, as then the efforts of the heart and other more subordinate organs are chiefly directed to the assistance of the stomach; but if that rest extends to profound sleep, digestion is retarded, and its effects are sensibly experienced if that sleep takes place soon after eating a hearty meal, and the food of course not had time to undergo any progress in its digestion, as then "results a suspension of the action of the relative organs of life, and a diminution of the action of the nutritive functions." I can speak from experience of my own personal sensations, that after riding twenty or thirty miles before breakfast, perhaps on a cold morning, and sitting by a warm fire while breakfast was preparing, when having fallen asleep for perhaps ten minutes, and have awakened very greatly refreshed by that short sleep; the same when returning fatigued from shooting or other strong exercise, I have found myself very greatly refreshed by a short sleep before dinner on some occasions when it has come upon me; but instead of which, if sleep comes upon me soon after eating a hearty dinner, and probably a few hearty draughts of ale or other liquor, I experience, on awakening from that sleep, great thirst and other uncomfortable sensations, quite the contrary to that of being refreshed by it. Not less than thirty years ago, my companions laughed at me, for advancing the opinion that appeared singular to them, and indeed also to myself, namely, that "five minutes' sleep before dinner was better than an hour's sleep after it." "This," as Hamlet says, "was some time ago a paradox; but now the times make proof of it." So it was with me; I only felt it from experience *to be so*; but now my eyes are opened by the explanations of these able physiologists and philosophers, that it *was always likely to be so*. Either the cravings of hunger, or an overloaded stomach, will prevent sleep, unless exhaustion renders rest and sleep so essential to nature as to predominate over those preventatives to it. If exhaustion predominates over hunger, sleep refreshes and invigorates; if over a full and loaded stomach, it retards digestion, and if to this be added liquids taken along with solid food before sleep, it is doubly prejudicial, as the digestion is in a greater degree impeded; a fresh secretion of the gastric juice ceases to take place, and thirst consequently ensues; the same by labour or strong exertion; it brings on thirst, (not as some say, hunger,) sooner than if at rest. On the other hand, if no liquids are taken with solid food till digestion has made a certain progress, they then "assist the chymification of the food, and the passage of the chyme through the pylorus;" thus that portion of the food which is partly digested, is assisted in its further progress, and that portion which has completed its digestion is assisted in being conveyed out of the stomach, thereby lightening its load, and enabling the animal to sleep with comfort and advantage.

In ordinary cases with greyhounds, water is sufficient to assist the chymification; but this matter is well worthy the courser's attention on extraordinary occasions, where a dog has suffered great distress, cannot be fed till late, and has to run again next morning. If he is fed at six, or even eight o'clock at night, he should have liquids given to him two or three hours afterwards; in which case warm broth without fat would be better than water; and warm beef tea would be better than broth, as adding a degree of nutriment with the liquid, which, with the warmth, restores the energy of the stomach, and gives additional strength to the frame; a small quantity will suffice.

We ourselves often feel full and uncomfortable an hour or two after eating a hearty dinner, and especially of cold meat; every thing is expanded by heat; so is cold meat expanded by going on the warm stomach, thereby occupying a greater space; but we all know, even had we eaten warm food, how much this uncomfortable fulness is relieved by a cup or two of warm tea a short time afterwards. It is the same with the dog; it is not more necessary to avoid giving him liquids with solid food, than it is necessary to be careful not to omit giving him liquids a few hours afterwards, (and on such occasions as above those liquids should be warm,) in order that he may receive the beneficial advantages resulting from uninterrupted peaceful sleep.

My favourite friend, old Gervase, may here be again introduced. "Dyetting, then, of greyhounds," says he, "consisteth of four especiall things, viz., foode, exercise, ayring, and kenneling; the first nourishing the body, the second the limbes, the third the winde, and the last the spirits." So in the first of these, in the food given to them, a combination of many considerations is required; the flesh, by its peculiar qualities, supports their strength under their labour, stimulates and produces courage and fire to undergo that labour, and by its nutritious properties, combined with that of the mixture of vegetable substances, and their variety of aliment essential to their best health, produces flesh on their bodies, which with exercise of proper quality and quantity, gives that fine muscular development and propelling power, which supports their strength and increases their speed; the different degrees of digestibility in the various aliments given, gradually nourishing the body, creating firm, not fatty flesh, of a good quality; keeping a portion of aliment, assisted by that food so peculiar to his nature and propensity to eat it, bone, on his stomach for a length of time, corresponding to that required between eating his meal, and being brought out to course, which will allow him the best of rest, undisturbed by any cravings of appetite for more food; the whole producing that strong, athletic, and fine state of condition, the bounding elasticity of limbs, sprightliness and animation of spirits, united, which are so essentially desirable.

Then again, in the words of old Gervase, "I would not go about to elect and prescribe what recreation the husbandman should use, binding all men to one pleasure: God forbid! My purpose is merely contrary; for I know in men's recreations that nature taketh to herself an especiall prerogative; and what to one is most pleasant, to another is most offensive; some seeking to satisfie the mind, some the body, and some both in joynt motion." So I would not presume to prescribe a specified weight of pounds, ounces, and grains, of any particular species of food, forbidding any others, for the nourishing of every and each particular greyhound; nor the number of miles, yards or inches of ground over which they should be galloped, trotted or walked on each and every particular day, in the manner of an A. B. C. alphabet; as if premising that each amateur of coursing, or his old and faithful servant and trainer, had not the skill or faculties to alter and control the management of his greyhounds, according to their nature and powers, and the variety of circumstances under daily occurrence; leaving it to be supposed that the dogs had stolen a march of intellect over their masters. I have collected the most valuable information within my reach, and canvassed the various matters in their several bearings, with my best care and ability, leaving the selection of which is best to pursue, under all the variety of circumstances that occurs, to their own guidance. On the general principle, in the question of quantity either of food or exercise, I would however prefer, if I made an error in it, to *under* feed the dog sooner than *overload* his stomach and system; or give him too *little* exercise sooner than make him dull in his spirits, or stiff in his joints, by giving him too much. If you under-feed him a trifle previous to his first day's coursing, you have that trifle more stimulus in reserve by an increase of food for the following day, should you fancy it necessary; if you over-feed him previously, severe coursing will create more fever, and consequent debility in him the following day. If you under exercise him a trifle, his first day's coursing will make his flesh and muscle more firm, and give him more perfect strength for the following and subsequent days; if you over exercise him previously, so as to render him dull or stiff, you may lose your first course by it, and thereby completely cut you out for cup, sweepstake, or whatever prize your emulation dictates your contending for. One week is long enough at a time to keep a greyhound in tip-top condition, and it may rationally be doubted whether it is possible to keep him in that tip-top state so long; he will soon get stale without an interval of relaxation; the endeavour ought, therefore, to be to push him up so as to arrive at as near perfection as possible the first day of running; and if he is a trifle under the mark, you have a better chance of having him fresh, when at the same time if he were over the mark, and had been so several days previously, he might become stale before the meeting was finished.

I do not doubt, that if two greyhounds, equally speedy and stout, and equally fed on nutritious food of gelatinous and farinaceous substances, without flesh, and one had much stronger exercise than the other, that the one of strongest exercise would have the best of a long course at the latter part of it; of that there would be *no doubt;* but whether he would win upon the whole course, the points throughout being duly taken into account, admits of a doubt, and of a *strong doubt*. A truer criterion may, however, be drawn of the question relative to gelatinous food, and such severity of exercise as some coursers give their dogs, on the one hand, and a happy mixture of flesh and bone, farinaceous and vegetable substances, properly administered, with good but more moderate exercise, on the other hand, by supposing two racing, red-necked, kicking hares, equally speedy and stout, one hare coursed by a brace of greyhounds, of equal powers to assist each other in their successive turns, fed on gelatine, with excess of strong exercise; and the other hare coursed by a brace equally able to assist each other, and of equal natural powers to the other brace of dogs, but fed on flesh, &c., and moderate exercise, where, as is stated to be the case sometimes at Amesbury, that a hare, two miles from covert, does not suffer one turn, although she had only common law given her; in the case of the gelatine fed dogs, if they could not turn her in the first mile, they would have but little chance of turning her at all, and she would kick up her heels at them, and triumphantly gain the covert, despite their best efforts to take her. But the other brace of dogs, with their greater strength and longer wind, and more momentum or propelling power, she would stand a chance to suffer many turns before she got a mile from her form, and run great risk of losing her life, without ever reaching her much-longed-for covert again.

After all that is said in this long chapter, the question of the best mode of training greyhounds resolves itself into a small compass; had I confined myself to the brief terms of which it is capable, it would have assumed the character of a mere matter of assertion, unsupported by argument or proof, and subject to as great a variety of opinion as has hitherto been the case, when a reason for any particular position is not given for it; every reader would of course judge for himself whether it was right or wrong; this they will now do; but as the different questions connected with the whole subject of training are separately treated of, perhaps more fully than some may deem necessary, it yet simplifies the consideration of them, and affords an opportunity for each reader to draw his own conclusions upon any part or parts of the subject which he may deem right or wrong, and accordingly pursue that system which he deems most proper. My own maxims are briefly as follow:—

Suit the exercise to the food given, and the food to the work required.

Train equally for muscular strength as for fine wind, as most conducive, not only to fine, but also to long wind, or stoutness.

The nature of the food to be congenial to the nature of the dog, and the organization of his digestive faculties. A happy mixture of flesh, bone, bread or biscuits, or pudding, and vegetables, with, occasionally, a change of diet; one satisfying meal in a day; without liquids for two or three hours after, and quiet rest; a small quantity of warm broth an hour or two before feeding, and a few bones when shutting up for the night; when in training an egg or two also, and a small quantity of light nutritious food in the morning before coursing.

Plenty of playful or gentle exercise before feeding, and the stronger exercise to be a racing pace for a moderate distance, with a little gentle exercise in the evening.

A full meal of raw flesh one day in a week or two, when the other part of the time they are fed on much lighter food, oppresses the stomach by loading it to a much greater degree than it is accustomed to, and by exhausting its energies, debilitates the stomach in a similar proportion to a severe day's coursing debilitating the whole bodily structure.

Nevertheless, a full meal of raw flesh for only one day gives an increase of flesh on the dog so strikingly evident, and of such increased firmness the next morning, that it proves, in my humble opinion, two important things; namely, that flesh is a congenial food for greyhounds; and, secondly, that their food has a more rapid operation in getting into their system than the food of other animals has, and to a certain degree, than it has in other dogs. This shows that their nature is calculated for a frequent change in the system of their management; from strong exercise and stimulating food, to a relaxation in both, to renovate them by an alternate changing, and *vice versâ*, by a gradual transition to more stimulating food and stronger exercise; and it consequently follows, that a long continued system of the latter is prejudicial to them.

A warm well ventilated kennel, well cleaned out the first thing in the morning, and the last thing before shutting up for the night; plenty of fresh clean straw to lie upon, and frequently brushed and cleaned on their bodies.

As this finishes the coursing part of the work, on which subject I shall probably not have again to treat, having done my fair portion of *labour in the vineyard,* I may be allowed to close this chapter with a specimen of the poetic muse of that justly celebrated amateur of the long dogs, Mr. Hoskins, written on the termination of one season's coursing campaign, wherein he was unsuccessful at Louth; redeemed his lost credit at Newmarket; and at Burton-upon-Trent was successful in matches and stakes, but disappointed in the last course for the cup, won by Mr. Hassall's Haut-ton, (high fashion,) Mr. Hoskins's Achilles winning the goblet; in which I, unlucky I! (as officiating judge, with two assistants, and all agreeing in the decision) was doomed to bear the brunt of the servants' and partisans' dissatisfaction, Mr. Hoskins, unfortunately for poor unlucky me, not being present. He afterwards bought Haut-ton, as I was informed, at thirty guineas.

"When late from Louth by *Weeping Cross* I came,
With faded laurels and a tarnish'd fame,
Still fondly hoped to wipe away disgrace,
And unabash'd once more to show my face;
Mark the result! At length Newmarket came,
And there regain'd I all my former fame;
See the proud list so pleasing to my eyes,
Even echo peals it almost to the skies.

"Next Burton list, which also flatters me,
And though I did not *get* the cup, you'll see,—
For mortals have not always what's their due,
Yet it was mine, had judgment lain with you.[1]
Great compliments were paid my general stud,
Their coats were glaz'd, their forms proclaim'd their blood,
Their groom was flatter'd, and their breeder too,
Condition good, and blood the right *true blue;*
Such ecstacy before I never felt,
The championship I'll claim,—and wear the belt."

EPIGRAM.

The luckiest one on coursing ground, with merit too not lacking,
Is one whom I will plainly show 's the far-famed man of Packing;[2]
For with Haut-ton, in single race, and very few to back her,
He got the cup—the goblet won—and all through JUSTICE THACKER.

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[1] Mr. Sketchley. [2] Mr. Hassall, of Packington.

FEEDING HOUNDS, POINTERS, &c.

THAT RUN BY SCENT.

"Should some more curious sportsman here inquire,
Whence this sagacity, this wond'rous power,
Of tracing step by step, or man or brute?
What guide invisible points out their way
O'er the dank marsh, bleak hill, and sandy plain?
The courteous muse shall the dark cause reveal.
The blood that from the heart incessant rolls
In many a crimson tide, then here and there
In smaller rills disparted, as it flows
Propell'd, the serous particles evade,
Through th' open pores, and with the ambient air
Entangled mix. As fuming vapours rise,
And hang upon the gently purling brook,
There by the incumbent atmosphere compress'd,
The panting chase grows warmer as he flies,
And through the net-work of the skin perspires,
Leaves a long—steaming—trail behind; which by
The cooler air condens'd, remains, unless
By some rude storm dispers'd, or rarified
By the meridian sun's intenser heat;
To every shrub the warm effluvia cling,
Hang on the grass, impregnate earth and skies,
With nostrils opening wide, o'er hill, o'er dale,
The vig'rous hounds pursue, with every breath
Inhale the grateful steam; quick pleasures sting
Their tingling nerves, while they their thanks repay,
And in triumphant melody confess
The titillating joy. Thus on the air
Depend the hunter's hopes."——*Somerville.*

THE amateurs of these several species of dogs will perceive, on perusing the preceding treatise, that the principle laid down with regard to greyhounds equally applies to other dogs, though in some respects the application in quantity and other matters may require to be somewhat different; this difference, in skilful hands, being so obvious, that little need be said on the particular parts and detail of them; yet a few remarks on feeding may be useful, and I will instance the foxhound, as perhaps undergoing the nearest to the greyhound in severity of exertion, and the nearest to him in speed; consequently requiring the best possible strength, the finest muscular development, and the best wind; without these, in general, or the last in particular, the fineness of his nose, or in other words, the sensibility of his olfactory nerves will be morbid, and not in perfection, and insensible to any but a strong scent.[1]

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[1] A few words may be added on rearing foxhounds. It has been said, that as they are now bred, foxes are *coursed* instead of being hunted, from the system pursued of breeding from the fleetest hounds; it is seen in the foregoing pages, that milk for growing puppies produces length and stature, while flesh produces width and thickness of the frame; therefore, according as you want your hounds to be very fleet, or only moderately so, so may you regulate your rearing of the puppies, by giving a greater proportion of one, and less of the other. Also as it is of course desirable to have them uniform in size to view, and in speed to pack well together on a good scent, so is it necessary that all the puppies should be reared on the same system; and I am well convinced that those two species of aliments being duly attended to, will make a great difference in that respect. I should, however, doubt the expediency of forcing them with new milk to such a degree as is necessary with a high-bred greyhound; for in greyhounds of a courser breed, that forcing system, long continued, renders them very large, and more resembling a coach horse than a race horse, and may cause your hounds to be larger than you would wish.

New milk ought, nevertheless, to be given to greyhounds in plenty when at a very tender age; say a few weeks before leaving their dam, and a month or more after, and at this time they should be under your own care; for although, when sent to quarters, there is many a *gude wife* who will suffer no living creature under her roof to want for good food, there are many others who would never give your puppies new milk unattended by the *blue cast* before-mentioned, either on the face of the milk or her own countenance.

Where only one puppy is at a farm-house he will have a chance of having *bones and buttermilk* in tolerable plenty; and with the bits of bread and other things thrown to them, with crushings from the cheese tub, and plenty of whey, and liberty to run about, they will thrive and do well. If

Strong exercise, with a foxhound in regular hunting, is out of the question; the intervening days they want rest and food; even in frosty weather when they cannot hunt, or at the commencement of the season, trotting them on the road a few hours every day or every other day, to harden their feet, and by the irritation of their muscular fibres to harden their flesh and make it firm, is about all that is necessary.

A foxhound, from his nature, does not require those frequent intervals for relaxation which is absolutely necessary for a greyhound; neither does the nature of his work admit of it during the hunting season when the weather is open; consequently, the system of feeding and management of the foxhound is more uniformly the same one week with another than with the greyhound. That circumstance, however, renders a change of diet, where it can be done, more imperatively necessary for their general health and vigour; for we have seen by Magendie's repeated experiments, before given in this work, the benefit of that change, or rather the disadvantage and injury for want of it.

This may be effected without inconvenience, and perhaps *is* practised in some kennels of foxhounds; but I have not heard of, nor seen any system recommending vegetables to be added to their food, except in very few instances; dogs of all descriptions feed, and do very well, on vegetable and animal substances the same as man; and vegetables may be added occasionally, if not generally, to the food of a foxhound in full work with advantage. They not only add to the nutriment, but what is of more importance, they add to the *variety* of the nutritive matter; and by the flavour they add, will induce a dog to eat more, if you wish him, than he would without them.

Flesh and oatmeal pudding is the general food for hounds; some days flesh only, others pudding only, and occasionally both; this is variety to a certain degree; but that variety may, without

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they have plenty of bones it will supersede the necessity of much flesh; yet a little once or twice in a week will be useful.

inconvenience and *with* benefit, be increased by adding vegetables on some of those days; as, for instance, where you give both flesh and pudding, the necessity for vegetables also is not so great; but where you give pudding only, and that pudding mixed up with the broth from flesh, which is the best way of using the broth, the vegetables should be boiled with the flesh, when they will mix with the pudding, and induce the hounds to eat more plentifully of it, where you think proper to allow them to eat their fill; turnips, carrots, or potatoes, add much to the flavour; in fact almost any description of vegetable is of service. Mangel wurzel would be a good vegetable for them occasionally.

Digestion going on in its regular and natural course is as essential to foxhounds, or any dog that works hard and hunts by nose, as to a greyhound; consequently broth in a liquid state, or any liquids, should be kept from them for two or three hours after eating solid food; also the hounds to be in a warm kennel and entirely at rest for that time, after which they may be allowed to lap water or broth; but they will not lap near so much under that system as if they had been allowed to do so more immediately after eating solid food; for, as has before been shown, liquids at the same time as solid food, create more thirst afterwards, and increase the evil, the solid food remaining to be digested when the stomach is in a state of debility, and the mucus membrane ceasing to secrete a fresh supply of the gastric juice, which causes thirst. It would be useless repeating here all the reasons in support of this, as the important points may be seen by reference to the feeding of greyhounds when in training for the course, where these reasons are fully canvassed in detail.

If digestion does not go on in its proper course, it produces bad wind, which, it must be obvious to every sportsman, is an enemy to the fine sensibility that is absolutely necessary for the organs of smell to possess; besides, indigestion prevents the food from affording that nourishment to the animal, and support to his strength, which it otherwise would afford him, and in a considerable degree; and it is before shown, that the strength being well supported by nutritious food, is as essential to good wind as the organs of respiration being free from obstruction; good wind is also dependent on the quality as well as quantity of the food given. The same erroneous notion of flesh being bad for wind, seems to have crept into the foxhound kennel as well as that of the greyhound; probably from not being aware of the ill effects from giving liquids at the same time as solid food; giving flesh either raw or parboiled, with broth in plenty at the same time, will be sure to cause bad wind; but they err in the opposite extreme in some foxhound kennels, boiling the flesh six, eight, or ten hours, supposing they have the nutriment in the broth, while so much goes off by evaporation, and they lose quality as well as quantity of nutriment, and give the hounds an unnatural meal, such as is fit only for a weak or sick hound, instead of a healthy one. The flesh loses its stimulating and exciting qualities in addition to losing a great portion of its nutriment; the hounds may have fine wind, but not for so long a time, as their bodily strength will sooner fail, and cause distress for wind. Boil the flesh moderately, and give it warm to the hounds without liquids, and they will have more strength, fine wind, and higher courage.

By a proper proportion of it, and a full meal made up of pudding and vegetables, the stomach will be gradually lightened of its load, and the aliment gradually coming into the system, will impart more solid flesh to the body than if all were reduced nearly to a jelly by boiling, and all come into the system together; besides a portion, the fleshy part of his food, and the bone, remaining longer on the stomach, by which the hound rests better through the night, not being disturbed by craving for more food. Equally wrong is it to feed with a full meal entirely of flesh.

If, for instance, you feed the day before hunting wholly on flesh, as much as they will eat, notwithstanding it was so early as to give time for the stomach and bowels to be sufficiently empty so as not to obstruct the action of the lungs, yet the stomach would be loaded its full load for a longer time, and probably disordered thereby, and the nutriment come into the system altogether, though a longer time before it does so, and the chest would be so loaded with fatty matter as not to allow its free and full expansion, and the blood so rich and overloaded as not to allow the free and rapid circulation required when the hound is going at great speed, and thus materially impede respiration. I am aware that this does not apply in so great a degree to the foxhound as to the greyhound; and that the foxhound will not only bear, but he requires to be fed with a greater proportion of flesh than the greyhound; the latter has no respite in his course; running with his greatest speed, not having far to travel before running, or that distance in a carriage, in which it is essential that he should be so conveyed; while the foxhound has to trot five, ten, or perhaps twenty miles to the fixtures, thus unloading his system from much of the superabundance of fatty matter before finding his game, with frequent intervals of slower hunting afterwards, as a respite for his wind, yet on the whole, be hard at work for many hours upon scent, and have to travel ten or twenty miles home afterwards, thus undergoing very great toil and fatigue, which must require a corresponding support in the shape of food. But when the well known changeableness of scent, with its variety and multiplicity of causes, is taken into the account, it is manifest that the organs of smell are as necessary to be in a good state to be susceptible of scent, as the organs of respiration are for the purpose of good wind; either or both are as necessary as proper food in proper quantity is for the support of the animal's strength; and that each and all are dependent one upon the other.

If the animal system is overcharged by containing a superabundance of fatty matter, the organs of smell would not be so susceptible of the presence of scent, as if not overcharged with it, even when first thrown into cover, before the hounds are distressed for wind, but how infinitely more insensible must they be of the presence of scent, when they are distressed for wind, the whole volume of air expired from the lungs forcing itself partly through the nostrils, and repelling the particles of odour from the hunted animal, which would otherwise strike upon those organs of smell?

A variety of causes are adduced by physiologists, by which the sense of smelling is much injured. Dr. Gregory says, "Whatever impedes the free entrance of the air into the nostrils, or its passage through them, cannot fail to injure the sense of smelling. Bad digestion also in the stomach, by exhaling a fetid vapour, may induce a depraved state of this sense."

Magendie says, "There escapes from almost every body in nature certain particles of an extreme tenuity, which are carried by the air often to a great distance. These particles constitute odours. Every odoriferous body has an odour peculiar to itself. The air is the only vehicle of odours."

These are what sportsmen call scent; the changeableness and variation of which from good to bad, or indifferent, has excited many speculative opinions upon the causes of it laying well or ill, as the term in general use is, different one day from another, or variations one way or the other many times in the same day. The particles of odour are emitted from all parts of the body both externally and internally, and possess a degree of heat from a living animal, which, when they lose, the odour becomes weaker; the time they are in losing their heat is according to the state of the atmosphere, and the nature of the ground on which they fall; a heavy dense atmosphere soon presses them to the earth; in an exceedingly light atmosphere, they rise upwards, and thus the hound loses the smell of them, as they are not present—they are above him. It is well known that the scent gets worse just before a storm comes on; they are moist, and have a chemical affinity with the moisture of the clouds, and are thereby attracted upwards. Beckford says, "On the richness of the soil, and the moderate moisture of it, does scent also depend, as well as on the air. It depends chiefly on two things, *the condition of the ground*, and the temperature *of the air*, both which should be moist without being wet. When the dogs roll, the scent seldom lies. If they smell strong when first come out of the kennel, it is a prognostic of good luck. In heathy countries where the game brushes as it goes along, scent seldom fails."

A fox may run on one side of a field, and the hounds feel a scent, or as the term is, carry the scent on the opposite side of that field, if the wind blows that way, as the wind carries the odoriferous particles along with it, some falling to the ground sooner than others, and in such cases a scent is felt by the hounds all over that field. If the wind is still, or nearly so, and the air of moderate temperature, the hounds carry the scent *breast high*, the particles of odour being in the air the hound's own height; ; if the atmosphere is a little dense, the particles are pressed downwards, and the hounds by questing have a whole volume of particles passing up their nostrils as they inspire the air, when they carry, what is termed, a burning hot scent. The particles lodge on brushwood, fences, and on the surface of the grass; but when these, and the air, cease to have them where the hounds are present, the last resort is from the footsteps of the animal; the particles are pressed on the ground, and according as the air or the ground is warmer or colder, the odour remains a longer or a shorter time. On grass ground the odour remains longer than on fallow or tillage ground; the pores of the latter being open, the particles sooner mix with, or are absorbed by the earth, and of course sooner become cool; hence in the old hunting song of

"A southerly wind and a cloudy sky proclaims a hunting morning,"

we have the lines,

> "Pick over, pick o'er the plough'd ground,
> Well hunted, well hunted, good hounds."

They draw the particles up the nasal cavities, by questing and inspiring the air, and I have seen hounds, when swimming a wide brook or river, *catch* a scent, and give tongue, when many yards from the opposite bank, the particles being drawn towards them by their inspiration of the air.

"The olfactory apparatus," says Mageudie, "ought to be represented as a sort of sieve, placed in the passage of the air, as it is to be introduced into the chest, and intended to stop every foreign body that may be mixed with the air, particularly odours. The apparatus is composed of the pituitary membrane, which covers the nasal cavities of the membrane which lines the *sinuses*, and of the olfactory nerve. The pituitary membrane covers the whole extent of the nostrils, increases the thickness of the spongy bones very much, is continued beyond their edges and their extremities, so that the air cannot traverse the nostrils but by long narrow passages. These canals are so narrow, that the least swelling of the pituitary membrane renders the passage of the air in the nostrils difficult, and sometimes impossible. The olfactory nerve springs by three distinct roots, from the posterior, inferior, and internal parts of the anterior lobe of the brain. Prismatic at first, it proceeds towards the perforated plate of the *ethmoid bone*; it swells all at once, and then divides itself into a great number of small threads, which spread themselves upon the *pituitary* membrane, principally upon the superior part of it. Smell is exerted essentially at the moment when the air traverses the nasal fossæ in proceeding towards the lungs. We very rarely perceive any odour when the air proceeds *from* the lungs; it happens sometimes, however, particularly in organic diseases of the lungs. The mechanism of smell is extremely simple; it is only necessary that the odoriferous particles should be stopped upon the pituitary membrane, particularly in the places where it receives the threads of the olfactory nerves. As it is exactly in the superior part of the nasal fossæ, where the passages are so narrow that they are covered with mucus, it is also natural that the particles should stop there."

"The physical properties of mucus are such, that it appears to have a much greater affinity to the odoriferous particles than to the air; it is extremely important to the olfactory sense that the nasal mucus should always preserve the same physical properties; whenever they are changed, as is observed in different degrees of *coryza*, the smell is either not exerted at all, or in a very imperfect manner."

"After what has been said of the distribution of the olfactory nerves, it is evident that the odours which reach the upper part of the nasal cavities will be perceived with greater facility and acuteness, for this reason; when we wish to feel more acutely, and with greater exactness, the odour of any body, we modify the air in such a manner that it may be directed towards this point. For the same reason, those who take snuff endeavour also to make it reach the upper part of the nasal fossæ."

I have transcribed only those parts of Magendie's remarks which tend to show how the odour, or as we term it, the scent of the animal acts upon the nasal organs; and also the olfactory apparatus, to show how subject the sense of those organs is to be impaired or depraved. For although nature has provided those animals that are ordained for the use of mankind, to hunt by means of his power of smelling, with avenues of capacity enabling him to inhale a greater volume of air, containing odoriferous particles, and the olfactory nerve also, in all probability, of greater sensibility than other animals are possessed of, yet the seat where the greatest acuteness of smelling is perceived, is situate in the upper part of the nasal cavities, to which the air has to traverse long passages, "so narrow, that the least swelling of the pituitary membrane renders the passage of the air in the nostrils difficult, and sometimes impossible." This pituitary membrane, being the conductor of the phlegm, it will be obvious is subject to a variety of causes which may induce an enlargement of it; a trifling organic disarrangement of the stomach or lungs will contribute towards that enlargement.

Animals provided by nature with the power of smelling, are supposed, by philosophers, to be protected against eating improper or unhealthy food by this organ; what is offensive to the smell is generally found to be unhealthy to the stomach. As one description of animal eats food that would be very unhealthy to another description of animal, so are their stomachs differently organized, and suitable for the kind of food their instinct disposes them to eat; and what is offensive to the smell of one description, is not offensive to the smell of another description of animal. We very rarely, if ever, see an animal eat any food that comes in its way without first smelling at it; a dog, fond as he is of bone, smells at it before he takes it into his mouth; horses or cows smell at the hay put before them before they eat it; a fish smells at the bait before he takes it; and the same by other animals.

The most important consideration, however, towards our present subject, is that of avoiding indigestion, and too full a habit of body by overcharging the system with a superabundance of fatty matter; too great a quantity of nutritious food, even though its digestion goes on in the regular and natural course. Sportsmen are too fond of their dogs to *under-feed* them; it is *over-feeding* them which requires most to be guarded against; and as dogs do not throw off superabundant matter by the skin during violent exertion, as is the case with men and horses, by perspiration, it can only be got rid of by exhalation, which passes through the mouth and nostrils, when froth is often observed at the mouth, at the same time the pituitary membrane is charged with phlegm and enlarged, thus impeding the passage of the odoriferous particles to that seat of smell most acutely sensible of the presence of scent.

Snuff-takers are aware of the immediate benefit from having recourse to their box when assailed with any offensive odour. The snuff occupies and covers that part which is sensible of smell, and guards it against the offensive odour; so does the phlegm of a dog overcharged internally with fatty matter, prevent the odour of the hunted animal from striking upon the sensible organs, the threads of the olfactory nerve.

Pointers, which are gormandizing feeders, and not exercised previous to taking out for shooting, are very subject to run in upon, and spring their game; for after running, and especially in hot weather, their pituitary membrane is filled and swelled with phlegm, so that it is impossible for them to scent their game. Indigestion acts in a two-fold manner, to the prejudice of a fine nose; the fetid vapour from the stomach passing the nostrils, and also causing a difficulty of respiration, which causes a blowing from the lungs, and the passage of a volume of air through the nostrils, which repels those odoriferous particles that would otherwise be inhaled by them, and strike upon the organs of smell.

Notwithstanding that I am cautioning against over-feeding with very nutritious food, I am well aware of the necessity of giving foxhounds a good proportion of sound, wholesome flesh to support their strength under their great labour and fatigue, and the greater the quantity of flesh, the greater the necessity of avoiding liquids; but the baneful practice with some is occasionally giving what is termed a belly full of raw flesh; if that is done two or three days before hunting, it will have a bad effect, and I should think no one would be so silly as to do so only the day before hunting; a proper proportion of flesh in their daily meals, their full meal made up with good pudding, that they may rest quietly without craving for more food, in a warm kennel, without liquids for a few hours, is the best way of attaining the greatest muscular strength and the best wind, and in addition, the finest nose. Bones should also be given them every opportunity; those days when pudding without flesh is most serviceable to them, (except when prevented from hunting regularly, and they have intervals of many days between,) is when they come home from hunting, and especially if they have had a hard day of it; the pudding should be moderately warm, and mixed with a portion of vegetables, some time before, or (the sooner the better,) after they get to the kennel, they should have some warm broth, which will restore their exhausted stomachs while the pudding is preparing for them, and will tend to create a more comfortable warmth in their bodies, when half an hour's rest on their bed will prepare them in a proper state to be fed, and their food do them the most service. This warm broth may be given with advantage the intervening days between hunting, an hour or two before feeding them a full meal of a greater portion of flesh, as the stomach will be restored by it, and the digestive process will receive more energy; after being fed, and being warm and at rest for three or four hours, a little water to lap will be of benefit to them.

I am satisfied that they are better without flesh when returned from a hard day's hunting, or with but a small portion of it, not only from the theory advanced by eminent physiologists, but also from repeated observations of the effects both on men and horses, as well as dogs; a horse, after a severe day's hunting, is better next morning without much corn overnight, especially beans. A similar distinction may, and ought, to be made between oats and beans for a horse, as between animal and vegetable food for a dog; the difference in quantity of nutriment is not great in either, though bean flour possesses less nutriment than oatmeal, pound for pound in weight. Beans, though a vegetable, like flesh to a dog, possess more stimulating and exciting qualities, and will increase the fever in the horse more than oats will do, and are therefore improper food for him when he has fever already upon him; it should be remembered, that though bean flour has a trifle less nutriment in the same weight than oats, yet a quartern of beans weighs much heavier than the same measure of oats, consequently a greater proportion of that stimulating quality is contained in that measure of them which produces fever. Warm bran mashes, with a few oats in them, suits him better, and does not increase his fever consequent upon severe work, as beans would do, and he will eat more corn next day, having less fever than if he had eaten beans over night. It is the same with respect to giving dogs flesh after severe work; when exhausted by bodily fatigue, and their stomachs exhausted by long fasting, there is sure to be a corresponding measure of debility, attended by its consequent fever, and which flesh will increase; in fact, flesh excites and stimulates, itself producing a degree of fever, which added to the fever consequent on debility, must act injuriously to the health and strength of the jaded animals at that particular juncture, which with rest and easy digestion will sooner subside, and they are ready the next day for what solid food you choose to give them; their stomachs are then in a condition to digest it in its regular course, and it will so much better restore their strength, and give them better wind than if fed with solid food while in the state described.

How admirably has nature adapted the hound for being peculiarly sensible of the presence of scent; the pointer and setter in similar manner; long capacious nostrils, to contain a large volume of air, in which the particles of odour are carried, with a blunt broad muzzle to stop or impede its passing by them, while the greyhound, which pursues his game by sight and not by scent, though he has a long nose, it is narrow and pointed, as if to split the air, or pierce through it with greater speed and facility, disregarding the odour it contains. Other species of dogs, the terrier, bull dog, shepherd dog, and such as have no particular avocation with scent, or great speed, though their noses are much wider than the greyhound, they are shorter than either greyhound, foxhound, pointer, or setter, and their nasal cavities cannot therefore contain such abundance of odoriferous particles as the hound, pointer, or setter, and their sense of the presence of scent is consequently much weaker.

Magendie says, "Physiologists have not yet determined the use of the external nose in smelling; it appears intended to direct the air charged with odours towards the superior part of the nasal cavities. Those persons who have their noses deformed, particularly if broken; those who have small nostrils, directed forward, have in general almost no smell; the loss of the nose, either by sickness or accident, causes, almost entirely, the loss of smell. According to the interesting remark of M. Beelard, such people recover the benefit of this sense by the use of an artificial nose."

This accounts for what many huntsmen, owners of hounds, pointers, &c., will readily recall to their recollection those instances of what are termed the finest nosed dogs having long, wide, nasal bones, and corresponding nasal cavities. Yet with these advantages of smelling, they nevertheless frequently overrun and lose the scent, without any visible cause; this is very commonly attributed to a change in the air, or the scent being foiled by sheep or other animals crossing the path of the hunted animal, or ploughed grounds intervening, and other causes; when the probability is, that such losing the scent is very often owing solely to the hounds being distressed for wind. It should be recollected, that when any man or animal is distressed for wind, his inspiration is quick and short, while the expiration of air from the lungs is for a longer time, and very forcible through the nostrils, much more so than the inspiration, a greater volume of air going in at the mouth, and a less volume inspired through the nostrils than is expired through them, consequently the hound has less chance of receiving the particles of odour in the upper regions of the nasal cavities, where the principal seat of smell is situate. This is in some measure confirmed by the *first cast*, if made forward, often proving right, while with a moderate scent, and a slower pace, the hounds run longer and further without being at fault; but with what is termed a burning hot scent, the hounds go very fast, and after a few miles they all at once lose the scent; this is very properly termed the *burst*, as the hounds burst away at a pace enough to burst or rupture the air cells of the lungs of horses to keep up with them; and I appeal to any huntsman, whether in such a case, the *cast forwards* does not very often prove to be the *right cast*, and by that, its ultimately proving that the fox had gone right forward? What is more likely to be the cause of the *check* so frequently known to occur after a *burst*, than the hounds being distressed for wind? You will frequently see them, if they go fast up a long hill, to be at *fault* before they get to the top of it. It, therefore, for this and many other acknowledged reasons, must be obvious, that the best possible wind is absolutely indispensable to all dogs that run *by nose*; and, as has been before shown with respect to greyhounds, such best possible wind cannot be obtained without the dog's strength being well supported by a proper quantity of nutritious and stimulating food, such as flesh, as in an under-fed dog, bodily exhaustion precedes and causes distress for wind, while with an over-fed dog, distress for wind precedes and causes bodily exhaustion. This is an axiom of my own, so far as I have never heard or read of that distinction being drawn by others. I, however, think it will stand the test of criticism.

With regard to the best and most proper quantity of flesh to be given to a hound or pointer, it is impossible to lay down any specified weight, much depending on the constitution of each dog, and also on the difference in the quality of the flesh, which varies much in horseflesh, so generally given to hounds. A skilful huntsman and feeder will be the best able to regulate the quantity of flesh, by observing the working of the hounds according to the quantity of flesh that has previously been given to them. However uncertain the point of quantity may be, there is no uncertainty whatever that flesh, in proper proportions, is the best food to support their strength under their greatest exertions; and that they should be entirely at rest, warm, and without liquids of any kind for two or three hours afterwards, in order that the flesh may give them the most strength and the finest wind; in addition to strength and wind, a proper proportion of flesh and bone will give them the most energy and courage. Those who allow their hounds broth, or allow them to lap water soon after a good meal of flesh, &c., or at the same time, if they refrain from doing so only for a very few days, will soon discover an evident improvement in their condition.

Much has been said by different writers on the question, whether it is best to give hounds warm or cool food; when they are in regular and severe work, warm food is certainly most desirable, as it acts as a restorative, and by stimulating the stomach, enables it to perform its functions with more power, and adds much to the comfort of the animal. When not in work, or not likely soon to be, there can be no great benefit from giving warm food; they would be better to be allowed to relax both in food and exercise, one to rest the limbs, the other the organs of digestion; a smaller proportion of flesh, and a greater one of pudding; not to deprive them altogether of flesh, and when work is required of them, to have a sudden transition from a weaker to a much stronger food; but by keeping them in a medium way, they are soon ready for work if wanted, and will be all the better for their previous relaxation.

The system of feeding pointers and setters should be the same as that of feeding fox or hare hounds; but exercise to pointers, whose work is often not so regular as that of hounds, is necessary to be attended to, previous to their being wanted to work; they are often very great feeders, and eat very greedily, and without exercise to get rid of the internal superabundance of fatty matter, and especially in hot weather, are subject to have the fineness of their noses depraved, and bad wind ensue, by the exhalation of that fatty matter, part of which comes down the nostrils, covers and swells the pituitary membrane, so that the odoriferous particles cannot come in contact with the threads of the olfactory nerve; besides which, exercise is necessary to the bracing and compressing of the muscular fibre, and strengthening the muscles of the lungs as well as the muscles of the limbs.

The cleanliness of the kennel, important for the health of the greyhound, or any animal, on account of the noxious matter generating gas, which mixes with the atmospheric air, inspiring oxygen with other gases, in different proportions to what is contained in the pure atmospheric air, being proved to be injurious to the lungs, it is particularly necessary that the kennel should be as sweet and clean as possible, where hounds, pointers, &c., are kept, which pursue their game by scent, and have need of such fineness of nose as to be most sensible of the presence of the least possible degree of odour; if they come out of a clean, well ventilated kennel in a morning, their stomachs not disordered, and in good condition, they perceive the odour from any herb, flower, or living body, and can distinguish between them, as a foxhound, in such a state, can distinguish between the odour from a fox and that from a hare; but if the kennel is filthy and badly ventilated, the sensibility of the organs of smell is depraved in the same, or in a greater proportion, than by the fœtid vapour from a disordered stomach or disordered lungs. Sensation is greater or less, according as you are more or less accustomed to the mere touch of any substance or body; it is the same by the organs of smell; the more constantly odour comes in contact with the olfactory nerve, the less sensibility that nerve possesses of its presence; if hounds have been all night in a filthy kennel, the nerve is depraved, has less energy and sensibility, than when they have been free from the contact of odour. This is so obvious, and the necessity for cleanliness so generally acknowledged, that I need not longer dilate on the subject.

FIGHTING DOGS.

The food of fighting dogs will admit a greater proportion of flesh and bone than that of other descriptions of sporting dogs; yet with them, as well as with men in training for the prize ring, to whom beef stakes are very properly a favourite training diet, an occasional change to mutton or other flesh, with a mixture of vegetables, is equally essential to their best strength and wind,[1] and should be given to them on the same system as it is given to the greyhound, foxhound, pointer, &c., namely, to be free from liquids, (except you give them a wine glass or two full of sherry,) and, if either, a longer time after feeding, with rest and warmth, until their food has undergone a process towards its chymification, when liquids in moderation may be given with benefit. A fighting dog's exercise cannot well be too severe, but not prolonged for too great a length of time; at least four days out of seven, when in training, he should have as fast exercise on the road as you can induce him to go; if he were set to draw a small cart, properly adapted to his size for an hour or two in a day, it would increase his muscular power, and strengthen his legs and those parts of his body which are brought into action when struggling with his antagonist. This of course should be done before he is fed; but exercise of a more gentle nature may also be given him some hours after he is fed, and a moderate quantity of food after it, which will conduce to his resting better during the night.

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[1] It appears that the flesh of full grown animals does not require to be so thoroughly cooked, without disordering the stomach, as that of younger animals; beef or mutton stakes, for instance, are found not to disagree with a healthy stomach, although only half dressed; whereas veal, if not well cooked, swells in the stomach, and causes it to feel very uncomfortable for some time afterwards; therefore, in changing the diet from beef or mutton, to veal, pork, &c., the latter should be thoroughly cooked, or it will have a prejudicial effect on the stomach.

He, of all other sporting dogs, should have a greater quantity of bone given to him; and if those bones were as large as he could crush, it would be better, as serving a two-fold purpose; namely, they are his natural food, containing much oily and nutritious matter, and will give him as much courage, and support his strength, as any food; and secondly, there is no method so effectual in exercising the muscles of his jaw, the masseter muscle in particular, by which he will be able to bite his antagonist more powerfully; crushing the bones will not dull the teeth with which he bites his antagonist, which are principally his fore teeth; he crushes bones with his hind teeth, or crushers, as they are termed.

This Work being principally written for sportsmen, I will now conclude it with a Song on hunting, (which I wrote many years ago to amuse a poor son who became blind by running a fork in one eye when three or four years old,) and which I think will not be inappropriate. He was musically inclined, and his principal manner of passing his time was at the piano forte, or singing; but the name of hounds or hunting always created a lively interest in him, and a hunting song was his greatest pleasure. It lays no claim to any particular merit, except its originality, and may suit the fancy of some votaries to the sport, although, as long songs are out of fashion with others, it may not suit their taste. The first verse, or part of it, was copied from the Sporting Magazine.

A FOX-HUNTING DAY.

Tune—Hearts of Oak are our Ships, &c.

Come cheer up, my lads, 'tis to glory we ride,
The dangers and pleasures of hunting to 'bide;
'Tis fox-hunting only, my friends, that can give
Us in honour, in health, and in pleasure to live;

Bits of steel are our nags, gallant blades are our men,
We always are ready,
Steady boys, steady,
To swish at the raspers[1] again and again.

Then merrily on our good hacks away trot,
And soon at the side of the covert we're got,
Where mounted afresh, soon the cheering view halloo,
Absorbs all our thoughts as we eagerly follow;

Bits of steel are our nags, gallant blades are our men,
But hold hard, gemmen, pray,
Just let him get away,
Then we'll swish at the raspers again and again.

Now on through the covert, bold Reynard he flies,
To foil his dread foes all experiments tries;
But the hounds they *try-on-him* no mettle do lack,
No refuge he finds from the musical pack;

Bits of steel are our nags, gallant blades are our men,
But hold hard, gemmen, pray,
Just let him get away,
Then we'll swish at the raspers again and again.

He then breaks away with the hounds at his brush,
When each gallant sportsman right onwards does push;
Hark forward, my lads, now hark forward away,
No bobbling at brooks, for we've no time to stay;

Bits of steel are our nags, gallant blades are our men,
Don't ride over the hounds,
Why we cannot—adzounds!
But we'll swish at the raspers again and again.

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[1] A rasping leap—a Meltonian term, expressive of a high and wide leap. —*Billesdon Coplow Poem.*

A FOX-HUNTING DAY.

Now gaily we ride over hedge, gate, and stile,
Without aught to check, or our pleasure to spoil;
The *old* hounds are taking the lead all the way,
And Reynard must die on this high scenting day;

Bits of steel are our nags, gallant blades are our men,
Don't ride over the hounds,
Why we cannot—adzounds!
But we'll swish at the raspers again and again.

Look yonder he goes, tally-ho, my good hounds,
Old Ringwood and Rally, their speed knows no bounds,
Yoix, Darter and Dauntless right on him do rush,
Woo-whoop, my brave fellows, now ride for the brush;

Bits of steel are our nags, gallant blades are our men,
Then we cut off the pads,
To divide 'mongst the lads,
That best swish'd at the raspers again and again.

Then our 'scapes and mishaps, as we gaily remount,
And many good jokes to each other recount,
Such a burning hot scent was throughout the whole chase,
Old Nimrod himself never rode such a pace;

Bits of steel are our nags, gallant blades are our men,
Each mellow toned hound
Our hearts make rebound,
As we swish at the raspers returning again.

Now home to the board with the smoking sirloin.
And cherish our hearts with the gen'rous wine;
We talk o'er the day with good humour and glee,
And sing and be merry as merry can be;

Bits of steel are our nags, gallant blades are our men,
Then each fill his glass
To his fav'rite lass,
And drink it in bumbers again and again.

We drink round in bumpers to each lovely lass,
And many choice fellows we toast in our glass;
Drink masters of hounds, then king of the kennel,
If his name you would know, they call'd him Old Meynell;

Bits of steel are our nags, gallant blades are our men,
Then fill up a bumper,
Give it a thumper,
To the fame of Old Meynell, and Meynell's again.

ERRATA. VOL. I.

PAGE
33, Note [1], for one may show, read one *dog* may show.
38, for refractiousness, read *refractoriness.*
40, — as thinking, read *thinking.*
74, — brutish bow, read *Cretish* bow.
75, Note [1], for conclusive, read *inconclusive.*
85, for Graccus, Graze, and Guy, read *Gracchus, Gaze, and Guy.*
118, — be obvious, read *obviously be.*

VOL. II.

PAGE
150, for own daughter of Bergami, read *grandaughter of Bergami.*
151—Misinformed of Hecuba being by Bergami instead of by his son Hercules, the statement of the proportion of alien to consanguineous blood in p. 151, is incorrect; it will therefore stand thus:—

CONSANGUINEOUS.	ALIEN.	
Hercules, ...1	Handy,..1—produced Harpalyse.	
Harpalyse, ...½ Hercules	Harold,..1 Handy,....½	produced Hasper.
Hercules, ...1	Quill, ...1—produced Hecuba and sister.	
	3½	

Deduct 1-8th of Harold same blood as Hercules.
Consanguineous 2 4-8th parts to 3 3-8th parts of alien blood in Hourglass and Harriet Wilson.

The former statement will nevertheless show what the proportion of alien to consanguineous blood would have been, had Hecuba been by Bergami. In either case, as compared with cousins, and half brother and sister, or equal portions of each sort of blood, it leaves a rational inference that a greater number of admixtures of each sort of blood, though in the same proportion on the whole, is preferable to that same proportion, with fewer admixtures; and that it tends more to keep up the size to the original standard, at the same time that it gives more fineness and symmetry of shape with stoutness of breed. In short it appears, that the frequency of change, though in a small degree, renovates the system, in unison with concentrating the elementary matter of the blood and of the organs.

162, — clog, read *clot.*
282, — were ribbed, read *well ribbed.*
395, — but I never, read *I never.*
460, Note [1], for greyhounds, read *foxhounds.*

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